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ANEMOCLINOMETER MEASUREMENTS OF REYNOLDS STRESS AND HEAT TRANSPORT IN THE ATMOSPHERIC SURFACE LAYER

By

C. B. Tanner

and

G. W. Thurtell

April 1969

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ANEMOCLINOMETER MEASUREMENTS OF REYNOLDS STRESS AND HEAT TRANSPORT IN THE ATMOSPHERIC SURFACE LAYER

FINAL REPORT

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Prepared by:

C. B. Tanner, Principal Investigator
G. W. Thurtell, Co-investigator

Department of Soil Science
University of Wisconsin, Madison, Wisconsin

For

United States Army Electronics Command
Atmospheric Sciences Laboratory
Fort Huachuca, Arizona

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PREFACE

We became interested in the anemoclinometer as a possible three-dimensional pressure-sphere anemometer in 1961 when Professor H. Lettau called it to our attention. Several features were of interest; the small size which would enable measurements near the ground, the internal angular precision of construction, and the stability and ruggedness of the probe were all valuable attributes. Most importantly, however, the vertical velocity, which is the most critical measurement, is obtained from a pressure proportional to the product of the vertical and horizontal winds. Consequently, the vertical wind is contained in a term of large magnitude, which can be measured with precision, and is then obtained by division rather than by differencing, which also lends precision to the measurement.

The early work, which validated the potential of the anemoclinometer as a three-dimensional anemometer, was supported under grant DA-SIG-36-039-62-G25 by the Atmospheric Sciences Laboratory, U. S. Army Electronics Command, Fort Huachuca, Arizona (formerly the Department of Meteorology, U. S. Army Electronics Research and Development Activity, Fort Huachuca, Arizona). This work, which included tests on frequency response, sensitivity of the anemometer to angular rotation, and a limited comparison to wind profile measurements of shear stress, was reported 1/ for the above

1/ Thurtell, G. W. and C. B. Tanner. 1965. Momentum Transport Measurement in the Atmospheric Surface Layer with the Anemoclinometer. University of Wisconsin, Department of Soil Science, Madison, Wisconsin, Final Report 1962-1965.

grant. The results also are presented by Thurtell [2].

The use of the pressure probe hinged upon a pressure measurement with severe requirements of sensitivity, zero stability, sensitivity stability and frequency response. The only pressure transducer available at that time which appeared to meet our requirements was one made by Datametrics, Inc., as described in this report and the earlier one. Datametrics was most helpful in modifying the sensor and the electronics to meet our requirements, including smaller transducer volume, distant separation of the transducer from the electronics, and read out of electrical zero and full scale.

Earlier experience with data-logging via a magnetic tape system [1,2] convinced us that the only feasible route was on-line computation. This was done in the experiments discussed in this report, and proved to be as valuable as we anticipated.

Most of the results in this report were obtained as part of the 1967 Cooperative Field Experiment conducted at the University of California at Davis and sponsored by the Atmospheric Sciences Laboratory, U. S. Army Electronics Command, Fort Huachuca, Arizona. The remaining data were gathered at the University of Wisconsin Hancock Experiment Farm.

We wish to express our appreciation to Mr. T. A. Black, graduate student who worked with us on the Davis California experiment and helped also at Hancock in providing all of

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2/ Thurtell, G. W. 1965. Momentum transport measurements in the atmospheric surface layer with the anemoclinometer. Ph.D. Thesis, Univ. Wis. (Pub. No. 65-11,179). 47 p. Univ. Microfilms, Ann Arbor, Mich. (Diss. Abstr. 1: 4017.).

the energy balance data. We owe thanks also to Dr. C. R. Stearns (Department of Meteorology, University of Wisconsin), Dr. W. O. Pruitt (Department of Water Science and Engineering, University of California-Davis), and Dr. J. A. Businger (Department of Atmospheric Sciences, University of Washington), who participated in the 1967 Cooperative Field Experiment and provided data used for independent comparisons of shear stress and sensible heat flux density.

G. W. Thurtell
C. B. Tanner

THREE-DIMENSIONAL PRESSURE-SPHERE ANEMOMETER SYSTEM

G. W. Thurtell, C. B. Tanner, and M. L. Wesely

ABSTRACT

A rugged and stable pressure-sphere anemometer system is described which provides an accurate measurement of wind velocity and direction within a meter of the ground. The horizontal wind velocity, $\overline{(u^2 + v^2)^{\frac{1}{2}}}$, agreed very closely with cup anemometer measurements, indicating good accuracy in the measurement of the dominant term, u. Eddy correlation measurements of shear stress with the pressure-sphere agreed very well with Davis shear-stress meter measurements and satisfactory agreement was found with data obtained from wind velocity profiles and from wind measurements using a drag coefficient. Ratios of $_{\sigma}w/u_*$ during neutral periods were found to be in excellent agreement with values derived by Panofsky and Lettau, providing further indication of the accuracy obtainable with the pressure sphere system.

1. Introduction

The basic mechanisms of turbulent transport in the layers of air within a few meters of the earth's surface are receiving increasing attention from researchers from many disciplines. Inadequate diffusion models are limiting research progress in meteorology, ecology, agriculture, water resources and air pollution since many of the critical problems in these fields are associated with the exchange of energy, gases and aerosols between the earth and its atmosphere. The testing and development of improved transport models requires accurate experimental data which is at present insufficient.

Field measurements of turbulent mixing processes have been few and generally inadequate because of the stringent requirements for the instrumentation. The wind velocity sensors must be accurate, stable under field conditions, fast responding, small for measurements near the ground, rugged, and must measure both the flow direction and velocity without seriously disturbing the flow. Sonic anemometers (Kaimal, et al., 1964; Kaimal, et al., 1968), bivanes (Gill, 1963; McCready and Jex, 1964; Cramer, et al., 1961), two types of heat-transfer anemometers; (Miyake and Badgley, 1967; Dyer, 1960), fast-response cup anemometers (Frenzen, 1965) and vertical, propeller-type anemometers (Thornthwaite, et al., 1961 and Holmes, et al., 1964) have all been used in the atmospheric surface layer but each fails to meet one or more of the essential criteria mentioned above for measurements near the ground. The pressure sphere is well-suited to measuring the lateral and vertical wind components because they appear as products with the

large longitudinal velocity in the basic pressure measurement. It is felt that the anemometer system to be described does meet these requirements to greater degree than do other available instruments and will thus aid research on turbulent diffusion processes.

The basic sensor of our system is the anemoclinometer described by Martinot-Lagarde, et al., (1952) and made by the Institut de Mecanique des Fluides[1/]. The tests to be described were conducted at the University of California at Davis as part of the 1967 Cooperative Field Experiment sponsored by the Atmospheric Sciences Laboratory, U. S. Army Electronics Command, Ft. Huachuca, Arizona. Wind velocity measurements made with our anemometer system were compared with cup anemometers. Eddy correlation shear stress measurements were compared both with wind profile data and with data from the large Davis shear-stress meter (Brooks and Pruitt, 1966). In addition measurements of the standard deviation of the vertical component of wind velocity are presented for Davis and also some from Hancock, Wisconsin.

2. Anemometer system

The anemometer system consists of a spherical probe with pressure ports drilled into its surface. This particular design of sphere, called Philip I, can be replaced satisfactorily by other styles. The pressures developed at these ports are transmitted through small tubes and measured by pressure transducers. The

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[1/] Institut de Mecanique des Fluides de Lille, 5, Boulevard Painleve, Lille (Nord), France.

electrical outputs of the pressure transducers can be analyzed to give the orthogonal components of the wind vector.

a. Spherical pressure probe

We used both 3-cm and 8-cm pressure probes as described by Martinot-Lagarde, et al., (1952). The 3-cm probe, shown in Fig. 1, consists of a spherical head mounted on a supporting shaft. A drawing of the head, showing some of the ports, is given in Fig. 2. When in use, the probe is fixed with the sphere on the upstream end of the shaft. Twelve small ports are drilled into the spherical surface and a pitot tube is centered in a Venturi which is bored in the sphere on the axis of the shaft. Eight of the twelve ports on the surface of the sphere are located on a circle at an angle of 47.5^o to the shaft axis and serve as reference ports for the pitot tube in the Venturi; these eight holes are connected to a common pressure-averaging cavity in the shaft. The other four holes lie at right angles in the x,z and x,y planes, and each hole is at 45^o from the shaft axis. The x-coordinate is taken parallel and the y- and z-coordinates perpendicular to the probe shaft, with z in the vertical plane. The open end of the pitot tube in the Venturi is in the upstream direction. The pressure difference

$$P_1 = P_t - P_m \tag{1}$$

between the pitot tube and the cavity common to the eight reference ports, is proportional to the dynamic pressure,

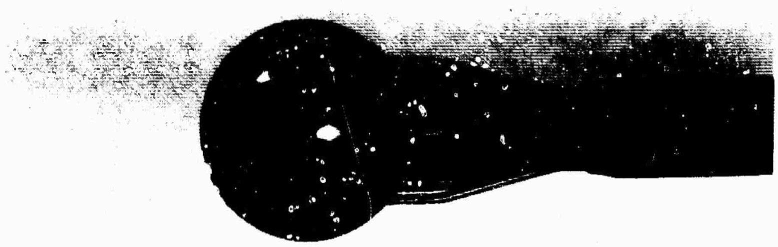

Fig. 1. Spherical sensing head of anemo-clinometer showing pressure ports.

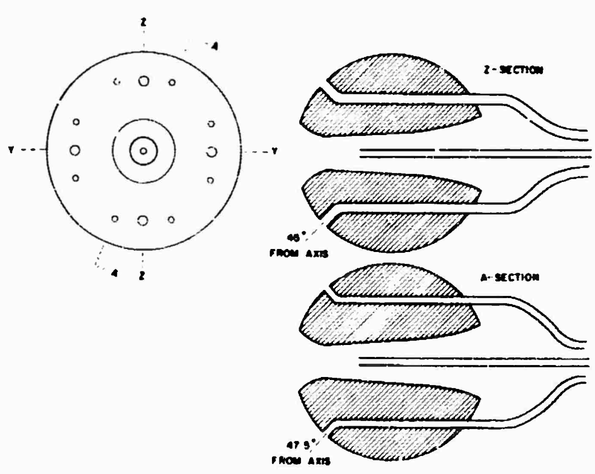

Fig. 2. Front and cross-section views of anemoclinometer head, with y- and z-coordinates shown on front view.

$$P_1 = \tfrac{1}{2} a \rho V^2 \qquad (2)$$

where

$$V^2 = (u^2 + v^2 + w^2) \qquad (3)$$

where u, v, and w are the axial, cross-horizontal, and vertical wind components, ρ is the fluid density, and "a" is a constant of the probe equal to 1.015 according to data supplied by the manufacturer. The pressure difference between the two vertical ports (x,z plane) and that between the horizontal ports (x,y plane) are predicted reasonably well by

$$P_2 = b \rho u w \qquad (4)$$

$$P_3 = b \rho u v \qquad (5)$$

The factor, b, is a function of the Reynold's number but is relatively constant in the Reynold number range of 2,000 to 200,000.

Calibration data supplied by the manufacturer indicated that for the 3-cm spheres, the pressure ratios P_2/P_1 and P_3/P_1 were linearly related to the angles F and G respectively by the equations

$$F = c\, P_2/(P_1 \cos G) \qquad (6a)$$

$$G = c\, P_3/(P_1 \cos F) \qquad (6b)$$

where c is a constant and F and G are the complements of the

directional angles. Accordingly,

$$w = V \sin F \tag{7a}$$

$$v = V \sin G \tag{7b}$$

$$u \approx V(\cos F)(\cos G) \tag{7c}$$

The components of the wind vector are described more closely by equations (3), (6), and (7) than by equations (3), (4), and (5). When using (6), an iterative procedure is used to solve for F and G which are then used in equations (7).

b. Pressure transducers

Capacitive pressure transducers manufactured by Datametrics, Inc.[2/] were chosen for the pressure measurement. The gains of the signal conditioners can be selected to provide full scale outputs ($\pm$ 5.0V) for differential pressures of 10, 20, 30, 60, 100, 200, 300, 600, 1000, 2000, 3000, 6000, 10,000 dynes cm^{-2}. The transducer has a maximum nonlinearity of about $\pm$ 0.1%, zero drift of 10^{-5} of maximum range per degree Celsius and sensitivity change of 2×10^{-2}%/C.

c. Frequency response

The frequency response and phase shift of a pressure transducer connected by tubing to a fluctuating pressure has been described by Iberall (1950), whose

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2/ Datametrics Incorporated, 87 Beaver Street, Waltham, Mass. (Model 511-8 Barocel).

analysis was basic to our system design. The response of the transducer is controlled by the size and length of the tubing and the effective internal volume of the transducers. The transducers used in our system were a special design which used a stiffer-than-normal diaphragm and a reduced internal volume of 1.6 cm^3 to improve the frequency response of the system. The spherical probe was connected by approximately 43 cm of approximately 1.5-mm I.D. tubing to the pressure transducer; tests showed this tubulation optimized the system performance.

The frequency response and phase shift of the system were checked by producing known sinusoidal pressure differences at various frequencies between appropriate ports on the surface of the pressure spheres and monitoring the amplitude and phase of the transducer output. Instead of attempting to produce the pressure differences between ports on a single sphere, two identical spheres were placed in separate pressure chambers with tubing connecting appropriate ports to the pressure transducers. Equal pressure fluctuations, 180 degrees out of phase with each other, were produced in the two chambers by pistons which were closely coupled to the chambers. The pistons were driven by a variable speed motor and the phase of the pressure fluctuation was determined by optically sensing the position of the Scotch yoke piston drive. Typical amplitude and phase shift characteristics of the 3-cm anemoclinometer and pressure transducer are shown in Table 1. The response was limited by the tubing used to construct the anemoclinometers and could be improved by redesigning the pressure sphere, tubulation, and transducer system for optimum performance.

Table 1. Anemometer system frequency response and phase shift.

frequency Hz	relative amplitude	phase shift (degrees)
1	1.00	0
5	1.02	18
10	1.05	48
15	1.00	76
20	0.84	100
25	0.63	126
30	0.47	145

d. Field installation

For field measurements, the pressure-sphere anemometer is mounted on a 2.5-cm diameter mast (Fig. 3) at the desired height. The anemometer is oriented with the shaft axis parallel to the anticipated direction of mean flow. The three pressure transducers are housed in a temperature-controlled ($\pm$ 0.2C) box which is an integral part of the mounting assembly located at the opposite side of mast to the pressure sphere. The temperature control provides the required zero stability. The whole assembly can be moved to different levels on the mast or completely removed as one unit without disconnecting the pressure transducers from the pressure sphere. The pressure transducers are connected by 150 m of cable to their power supply and signal conditioners which are housed in a 2.5 x 6 m air-conditioned instrument trailer.

The masts are on pivot points and supported higher up by guy wires attached to bearings. This arrangement

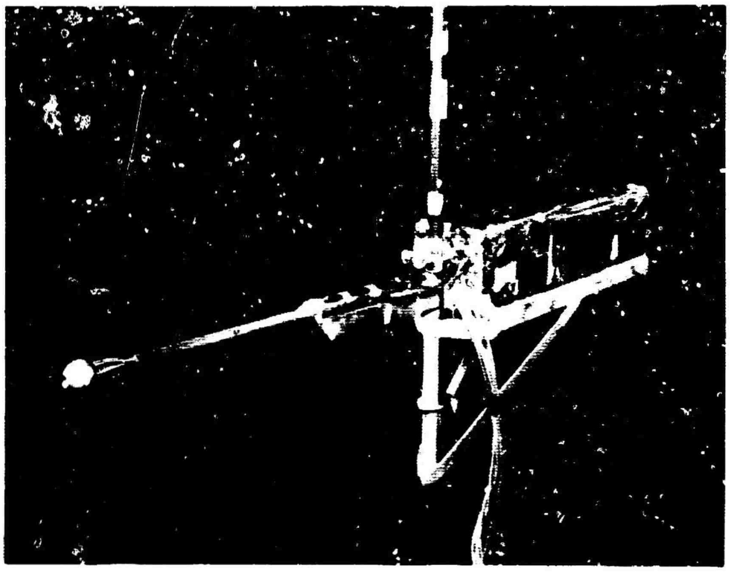


Fig. 3. Anemometer assembly on its mast.

allows the mast to be rotated so that the probe can be oriented easily into the mean wind. When the data discussed below were obtained, the anemometer was rotated in azimuth manually into the mean wind; at the beginning of each half-hour run the orientation was adjusted to the position of the mean wind for the previous half hour. Since then, a motor assembly, controlled by the $P_3 = b\rho uv$ output of the wind probe, has been used to continuously but slowly adjust the position of the probe into the wind. The orientation of the mast is monitored through the output of a potentiometer attached to the base of the mast and is included in the calculation of the components of the wind vector.

3. Data handling

Since the sensors respond to frequencies as high as 30 Hz, a large amount of data must be analyzed if the system is operated over extended periods of time. Storing large quantities of data under field conditions is costly and often results in a serious reduction in data quality. In addition it is highly desirable that some data analysis capability be available at the experimental site so that the experiment can [illegible] run efficiently and [illegible]rumentation faults detected as soon as possible. After a careful study of the available alternatives we elected to drastically reduce, by digital on-line computation, the quantity of data to be stored to the point where it could be typed out in table form by a typewriter or stored on paper tape. In 1967, this amounted to a data reduction of approximately 18000:1.

In 1967 the data analysis was performed on an EMR 6020

computer[3/] and later on the faster and smaller EMR 6130. The 1967 system included a Raytheon A-D converter, 6020 computer and model 33 teletype with paper tape reader with punch. The 6130 system includes an EMR 2701 converter, and a higher speed paper tape reader and punch in addition to the model 33 teletype.

Five channels of analogue data were obtained at each of three sites to give a total of 15 channels. At each site three channels represented the three pressure differences P_1, P_2, P_3 and the other two channels represented a fast response resistance thermometer (Wesely, et al., 1969) and a fast response barium fluoride relative humidity element (Jones, 1967). The velocity components of the wind vector were calculated using equations (6) and (7) and means, squares, and crossproducts of the five parameters (u, v, w, T, e) were calculated, where T, and e were the temperature and vapor pressure respectively.

The complete operation (i.e. 15 channels of analogue to digital conversion and the data analysis) was repeated 40 times per second. At the end of each half-hour sampling period the necessary scaling operations were performed and the outputs were teletyped. Approximately 2.5 minutes of each half-hour period were required for output and no data were collected during this time.

This data system has proven to be a very efficient and powerful research tool and it is felt that the success achieved with the anemometer system would not have been possible if, alternatively, data storage equipment had been selected.

[3/] Electro-mechanical Research, Inc., 8001 Bloomington Freeway, Minneapolis, Minn.

4. Tests of anemometer system

A complete description of the experimental area may be found in Brooks and Pruitt (1966). A plan of the field site is given in Fig. 4, showing the heights and spatial arrangement of our three anemometers with respect to the 6-meter, Davis shear stress lysimeter and the triangular array of masts installed by Dr. C. R. Stearns, University of Wisconsin Department of Meteorology. These masts carried cup anemometer and aspirated dry- and wet-bulb thermometers. The surface was uniform alta fescue, 5 to 10 cm high, which was periodically mown.

Wind velocity measurements with our pressure probe are compared with cup anemometer data and our eddy-correlation, shear stress measurements are compared with both shear stress lysimeter data and shear stresses obtained by Dr. Stearns' preliminary analysis of his vertical profiles of wind velocity and of temperature (KEYPS-type, diabatic profile analysis). In addition, a graphical description of the vertical fluctuations of wind velocity as a function of the stability parameter z/L is presented.

a. Comparison of wind velocity measurements

The on-line computer program which was used to analyze our anemometer data included the calculation of the horizontal wind.

$$\overline{V_H} = \overline{(u^2 + v^2)^{\frac{1}{2}}}$$

where u and v are the instantaneous values of the horizontal components of the wind vector. The value of $\overline{V_H}$ is primarily dependent upon P_1, as given in (2), and

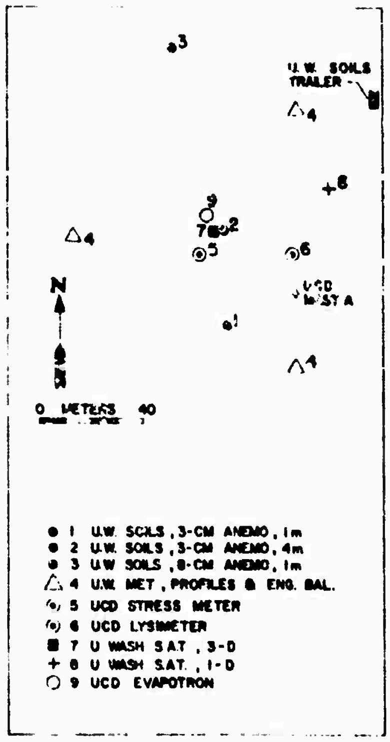


Fig. 4. Plan of the site of the 1967 cooperative field experiment.

since u generally is much larger than either v or w, errors associated with the measurement of wind angles calculated from (6) do not seriously degrade the estimate of $\overline{V_H}$. The good agreement between $\overline{V_H}$ and cup anemometer measurements presented in Fig. 5, demonstrate the accuracy of pressure-sphere measurements of u.

b. <u>Comparison of shear stress measurements</u>

Shear stress measurements obtained with the pressure-sphere anemometer are compared with data from the shear-stress lysimeter and from analysis of the wind profiles. The data obtained on May 2, 3, 4, and 5 are presented in Figs. 6 and 7. The pressure-sphere anemometer data represent the average of measurements available at the three sites. The shear stress data from the three wind profile sites also were averaged. The Davis shear stress lysimeter independently measures the north-south, and east-west components of the surface shear stress and the data used were computed by W. O. Pruitt as the vector sum of the half-hour means of these components.

Agreement among the three methods is satisfactory even though the aerodynamic analysis generally provides somewhat larger values than the other two methods. This discrepancy appears unduly large on May 4 and 5. The average z_o value computed from the wind profiles is 0.95 cm for May 2 and 3, and about 1.4 cm for May 4 and 5. For the latter two days new estimates of the shear stress were calculated via a drag coefficient using z_o = 0.95 cm, a KEYPS diabatic correction and the cup anemometer wind velocity at 80 cm. The results of this calculation are more consistent with the comparisons on May 2 and 3. Calculations indicate that best agreement between drag

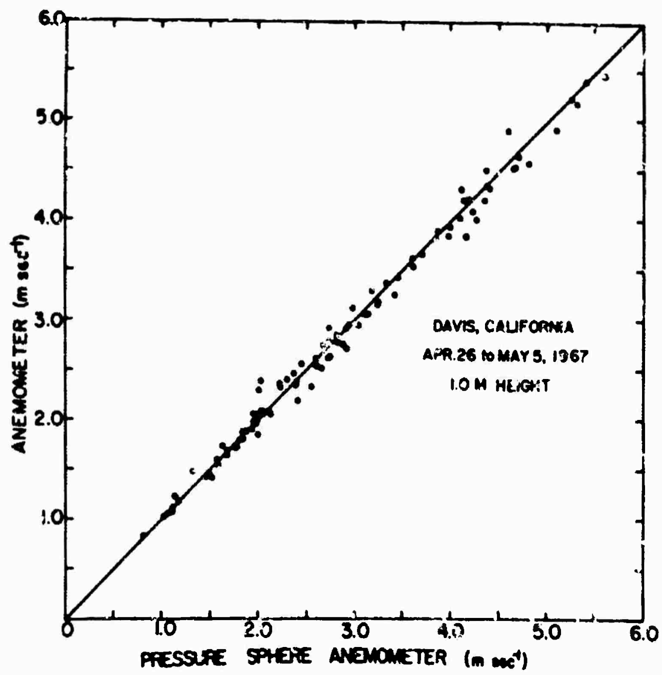


Fig. 5. Comparison of horizontal wind measured with the three-dimension anemometer and with cup anemometers.

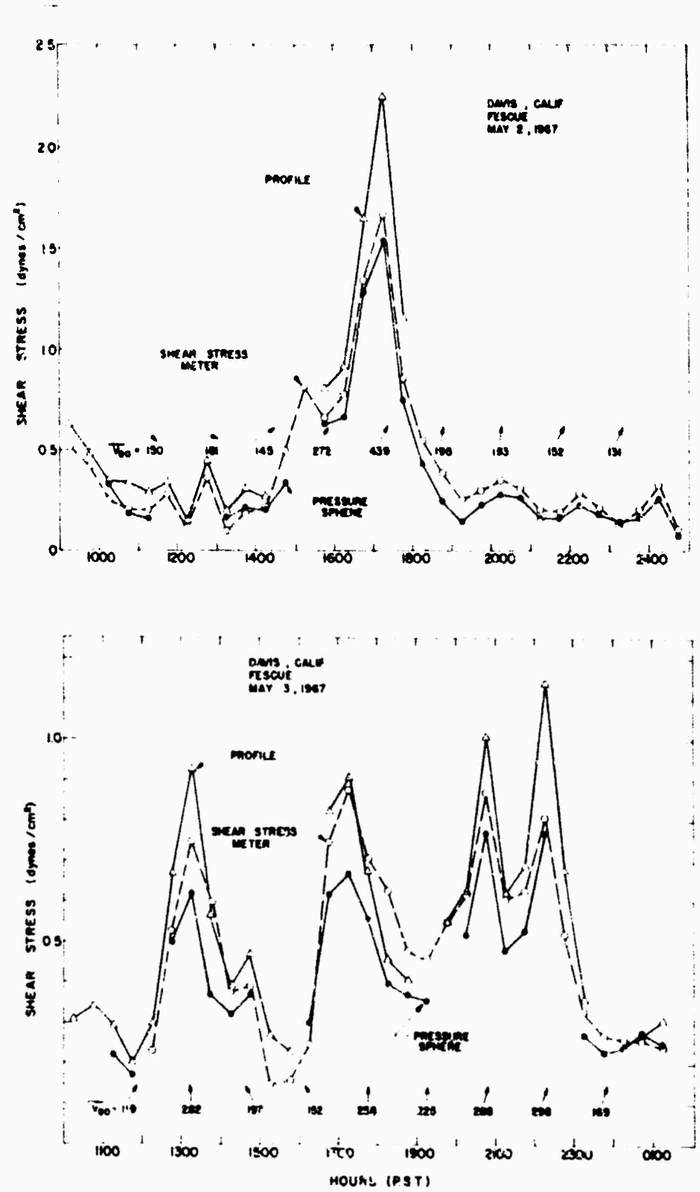


Fig. 6. Comparison of shear stress measurements on May 2 and 3, 1967.

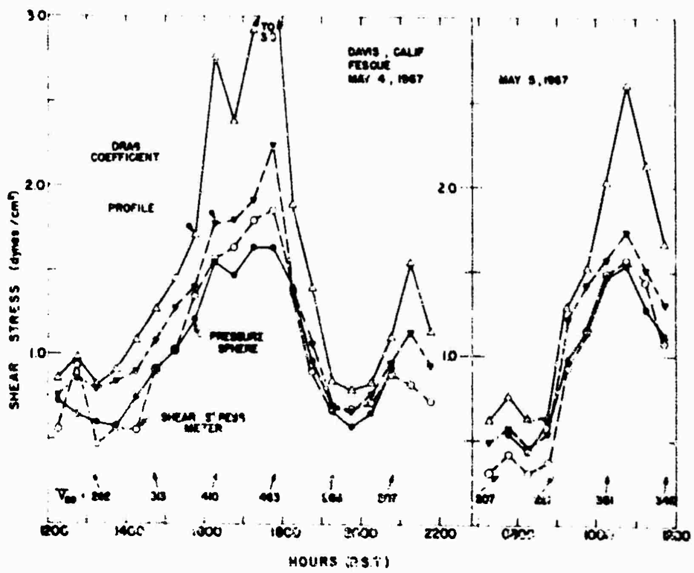


Fig. 7. Comparison of shear stress measurements on May 4 and 5, 1967.

coefficient and eddy correlation determinations would have been obtained by using $z_o \approx 0.7$ cm.

c. Standard deviation of the vertical wind

Ratios of the standard deviation of the vertical component of wind velocity to the friction velocity, u_*, as measured at the two 1-m sites and one 4-m site, are plotted in Fig. 8. The comparison of horizontal wind measured with our anemometer system and with cup anemometers indicates that our pressure-sphere anemometer measures the u-component of wind velocity accurately. Accordingly the ratio $\sigma w/u_*$ would vary as the square root of a constant percentage error in the measurement of w. This is not a very sensitive test of the measurement of the vertical component of velocity since the error in w would be twice that in $\sigma w/u_*$, but our value of 1.25 for $\sigma w/u_*$ under neutral conditions is the same as that derived by Panofsky, et al., (1967) and close to the value of 1.33 predicted by Lettau (1968). Over one hundred additional data points were collected over snap beans (z_o = 4 cm) in 1968 at Hancock, Wisconsin. The data, averaged over stability ranges of z/L = - 0.15 to 0.25, are also presented in Fig. 8 and are very similar to the Davis data. For ready comparison with the Panofsky (1967) and Panofsky et al. (1967) the curve $[1 - (z/L)/s]^{\frac{1}{4}}$ is plotted.

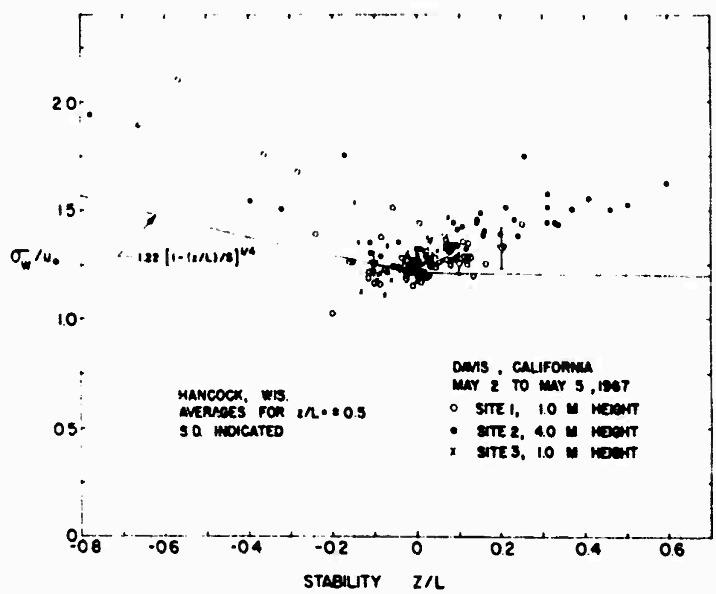


Fig. 8. Ratio $\sigma w/u_*$ as a function of z/L.

REFERENCES

Brooks, F. A. and W. O. Pruitt, 1966: Investigation of energy, momentum, and mass transfer near the ground, University of California-Davis, Final Rept., 1965, U. S. Army Electronics Command Grant DA-AMC-28-043-65-G12, 259 pp. DDC Accession # AD 635 588.

Cramer, H. E., F. A. Record, and J. E. Tillman, 1961: Studies of the spectra of vertical fluxes of momentum, heat and moisture in the atmospheric boundary layer. Ann. Rept., Meteor. Dept., Mass. Inst. Tech. 130 pp.

Dyer, A. J., 1960: Heat transport anemometer of high stability. J. Sci. Instr., 37, 166-169.

Frenzen, P., 1965: Determination of turbulence dissipation by Eulerian variance analysis. Quart. J. Roy. Meteor. Soc., 91, 28-34.

Gill, G. C., 1963: Data validation. Dept. Meteor. and Oceanog., University of Michigan, Publ. No. 79, Ann Arbor. 23 pp.

Holmes, R. M., G. C. Gill, and H. W. Carson, 1964: A propeller-type vertical anemometer. J. Appl. Meteor., 3, 802-804.

Iberall, A. S., 1950: Attenuation of oscillatory pressures in instrument lines. U. S. Nat. Bur. Standards. J. Res. , 45, 85-108.

Jones, F. E., 1967: Study of the storage stability of the barium fluoride film electric hygrometer element. U. S. Nat. Bur. Standards J. Res., 71C, 199-207.

Kaimal, J. C., H. E. Cramer, F. A. Record, J. E. Tillman, J. A. Businger, and M. Miyake, 1964: Comparison of bivane and sonic techniques for measuring the vertical wind component. Quart. J. Roy. Meteor. Soc., 90, 467-472.

Kaimal, J. C., J. C. Wyngaard, and D. A. Haugen, 1968: Deriving power spectra from a three-component sonic anemometer. J. Appl. Meteor., 7, 827-837.

Lettau, H. H., 1968: Studies of effects of boundary modification in problems of small area meteorology. University of Wisconsin Ann. Rept. 1966-67. U. S. Army Electronics Command Grant DA-AMC-28-043-66-G24, 156 pp.

MacCready, P. B., and H. R. Jex, 1964: Response characteristics and meteorological utilization of propeller and vane wind sensors. J. Appl. Meteor., 3, 182-193.

Martinot-Lagarde, A., A. Fauquet, and F. M. Frenkiel, 1952: The IMFL anemoclinometer -- an instrument for the investigation of a fluctuating velocity vector. Rev. Sci. Instr., 23, 661-666.

Miyake, M. and F. I. Badgley, 1967: A constant temperature wind component meter and its performance characteristics. J. Appl. Meteor., 6, 186-194.

Panofsky, H. A. and B. Prasad, 1965: Similarity theories and diffusion. Int. J. Air Water Poll., 9, 419-430.

Panofsky, H. A., N. Busch, B. Prasad, S. Hanna, E. Peterson, and E. Mares, 1967: Properties of wind and temperature at Round Hill, South Dartmouth, Mass. Pennsylvaria State University Tech. Rept. ECOM-0035-F. U. S. Army Electronics Command Grant DAB07-67-0035, 95 pp.

Thornthwaite, C. E., W. J. Superior, J. R. Mather, and F. K. Hare, 1961: The measurement of vertical winds and momentum flux. Pub. in climatology, 14(1), Centerton, N. J.

EDDY CORRELATION MEASUREMENTS OF SENSIBLE HEAT FLUX NEAR THE EARTH'S SURFACE

M. L. Wesely, G. W. Thurtell, and C. B. Tanner

ABSTRACT

A three-dimensional pressure-sphere anemometer and fast thermometer system (P.S.A.T.) was used to measure vertical heat flux density in the atmospheric surface layer at one to four meters above alta fescue and snap beans. Good agreement with independent measurements was obtained, which shows that the P.S.A.T. is sufficiently small and has adequately high frequency response and accuracy for eddy-correlation measurements within one meter of the surface. Also obtained with the P.S.A.T. were $(\overline{u'T'})/(\overline{w'T'})$, $r_{u,T'}$, $r_{w,T'}$, and σ_T/T_* and their dependence upon stability. When the atmosphere was thermally stable, slow wave motions frequently increased σ_T even though turbulent mixing was lacking.

1. Introduction

The turbulent vertical heat flux, H, in the atmospheric surface layer over a horizontally uniform surface can be determined from

$$H = \rho \, c_p \, \overline{w'T'} \qquad (1)$$

where ρ is the air density, c_p is the specific heat of air, w is the vertical wind velocity, and T is the air temperature. The bar denotes a time average and the prime denotes an instantaneous deviation from the time-averaged quantity. The major difficulty with making eddy correlation measurements of turbulent heat transport is in measuring the vertical wind. This requires an accurate and stable anemometer that measures the wind components with a sufficiently high frequency response for use close to the surface where the fetch requirements are minimum. At present, the most promising anemometers are sonic anemometers, either pulsed wave (Mitsuta, 1966) or continuous wave (Kaimal, et al., 1968), and the pressure-sphere anemometer (Thurtell, et al., 1969). The pressure-sphere anemometer is smaller than sonic anemometers and thus can be used closer to the surface where eddies are smaller.

This paper describes the measurement of turbulent heat transport with the pressure-sphere anemometer and a small, fast-response, resistance thermometer. Measurements of heat flux above alta fescue are compared with independent measurements made by others at the University of California at Davis as part of the 1967 Cooperative Field Experiment sponsored by the Atmospheric Sciences Laboratory, U. S. Army Electronics Command, Ft. Huachuca, Arizona. Also presented are measurements of heat flux

made in 1968 over snap beans at the University of Wisconsin Hancock Experiment Farm. A summary of the standard deviation of temperature, σ_T, divided by the dimensionless temperature scale, T_*, and of correlation coefficients for wind and temperature also is given for measurements over the above two surfaces.

2. Equipment, sites, and comparison measurements.

a. Pressure sphere anemometer-thermometer assembly

A fine-wire-resistance thermometer (Wesely, et al., 1969) was mounted parallel to the horizontal ports of the pressure sphere (Thurtell, et al., 1969), as shown for a 3-cm diameter sphere in Fig. 1. The closest edge of the thermometer was about 1.25 cm from the 3-cm anemoclinometer and about 2.5 cm from the 8-cm anemoclinometer. The thermometer was placed so that the sensitive element was slightly upwind of the leading edge of the pressure sphere; tests showed that this forward placement was necessary to prevent thermal modification of the air that flowed to the thermometer past the large thermal mass of the sphere. The thermometer was outside the angle of acceptance of the anemoclinometer and tests showed that the flow patterns around the sphere were not significantly affected.

When the 1967 data were obtained, the anemometer was rotated in azimuth manually into the mean wind at the beginning of each half-hour run. During 1968, a motor assembly, controlled by the anemometer, rotated the mast to point the anemometer into the wind. The azimuth rotation of the mast was monitored with a potentiometer attached to the base of the mast and was included in the

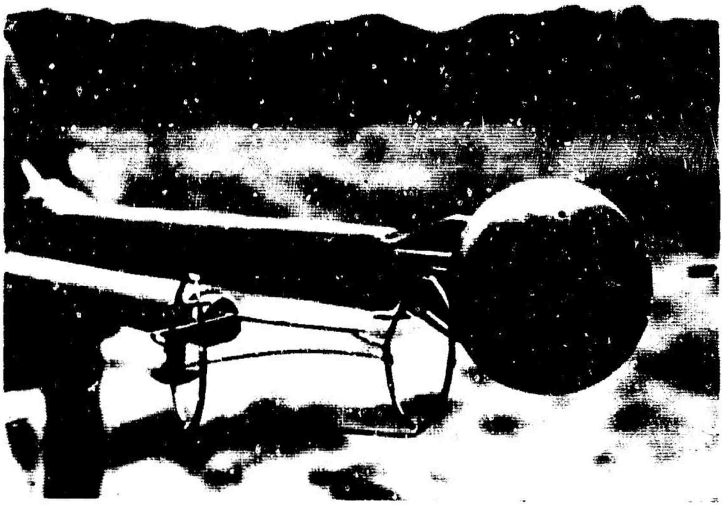


Fig. 1. Arrangement of thermometer with the anemoclinometer.

calculation of the components of the wind vector.

b. Data handling

The current through the thermometer was kept nearly constant at 0.3 ma by its bridge, which was located about 5 m from the thermometer. The bridge output was fed directly into a floating differential amplifier with a 1000 gain, to provide a signal with a temperature sensitivity of about 0.6C v^{-1}. The amplifier output was transmitted through 150 m of cable to the instrument trailer. The thermometer and anemometer signals were fed to a scanner-converter and an EMR computer as described by Thurtell, et al., (1969). The sampling rate was 40 sec^{-1} in 1967 and 150 sec^{-1} in 1968.

The outputs of the thermometer bridges were filtered in the amplifiers to match the phase shifts and response of the pressure-sphere anemometer and also to avoid high frequency noise. The response of the two systems are shown in Fig. 2. The curves for the anemoclinometers are roughly representative of the vertical wind component.

c. Site description

A description of the site of the 1967 Cooperative Field Experiment, and our instrument locations as well as the locations of other relevant instruments may be found in Thurtell, et al., (1969).

The 1968 measurements at Hancock, Wisconsin were on a 100 x 160 m field of snap beans planted in rows spaced at 90 cm. The snap beans were about 30 cm high and provided about 50% cover over Plainfield sand. The fetch was 60 m to the north, 50 m to the east and west and 100 m to the south. Beyond these boundaries to the south was alfalfa extending for 150 m to a 15-m high

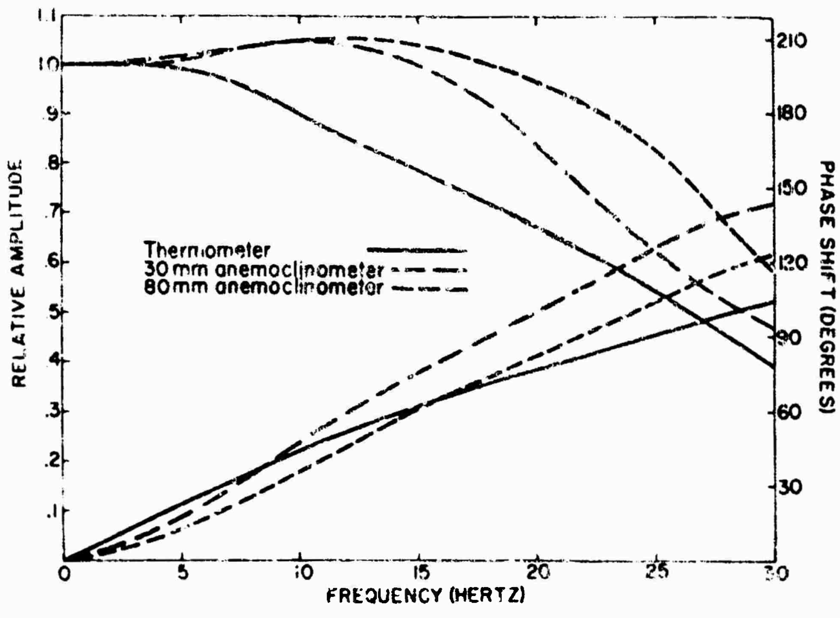


Fig. 2. Frequency response and phase shift of the thermometer system and of the anemometer system.

woods and to the west was an alfalfa field extending 100 m to a 10-m high shelter belt, to the northwest were low crops extending 200 m to a shelter belt, and to the east was alfalfa extending 300 m to a woods. The wind was predominately from the south and west during the tests.

d. Independent measurements of sensible heat flux

During the 1967 Cooperative experiment, Dr. C. R. Stearns, University of Wisconsin, measured wind, temperature, and vapor pressure profiles at three locations in a triangular array. At the same locations, he measured net radiation and soil heat flux density for energy balance calculations. The sensible heat flux was calculated from the energy balance using Bowen's ratio, $\beta = \gamma \Delta T/\Delta e$, determined from vertical temperature and vapor pressure differences measured over the same height intervals within 120 cm of the surface. An aerodynamic calculation of the sensible heat flux also was made using the wind and temperature profiles to find the shear stress with a KEYPS-type analysis and then using similarity ($K_H = K_M$) and the profiles to find the heat flux. Dr. Stearns supplied us data from both analyses.

The University of California-Davis group measured the evaporation with a 6-m diameter weighing lysimeter (Pruitt and Angus, 1960). In addition, they measured net radiation and soil heat flux near the lysimeter. The sensible heat flux density was calculated by differencing the energy balance terms as $H = R_n - G - E$. The Davis group also measured the sensible heat flux directly with an Evapotron (Dyer and Maher, 1965). Both measurements were supplied to us by Dr. W. O. Pruitt, University

of California-Davis.

The University of Washington group measured the sensible heat flux both with a one-dimensional sonic anemometer thermometer (Kaimal and Businger, 1963) and with a three-dimensional unit (Mitsuta, 1966). These data were supplied by Dr. J. A. Businger.

The comparison data at Hancock, Wisconsin were obtained by differencing measurements of net radiation, soil heat flux density and evaporation. The evaporation was measured with a 2.1 x 5.5 m weighing lysimeter (Black et al., 1968), the net radiation was measured with a large Funk radiometer, and the soil heat flux was measured with soil heat flux plates (Fuchs and Tanner, 1968) and integrating soil thermometers (Tanner, 1958).

3. Heat flux density comparisons

During the 1967 Cooperative Field Experiment, fetches were easily in excess of 100 m, except for small changes in elevation, since the wind was predominately from the south and southwest where fields had similar vegetation and roughness.

Heat flux estimates by the pressure-sphere anemometer and thermometer system (called the P.S.A.T. hereafter) were averaged from two 1-m high units and one 4-m high unit to give the results shown in Fig. 3. There was no systematic difference of heat flux measured at the two heights except from 1615 to 2015 on April 27, when the data from the higher mast were discarded. Heat flux data from a three-dimensional, sonic anemometer-thermometer at four meters above the surface and one-dimensional, sonic anemometer-thermometer 2.2 m high agreed well with the P.S.A.T.; the scatter of estimates at our three different P.S.A.T.

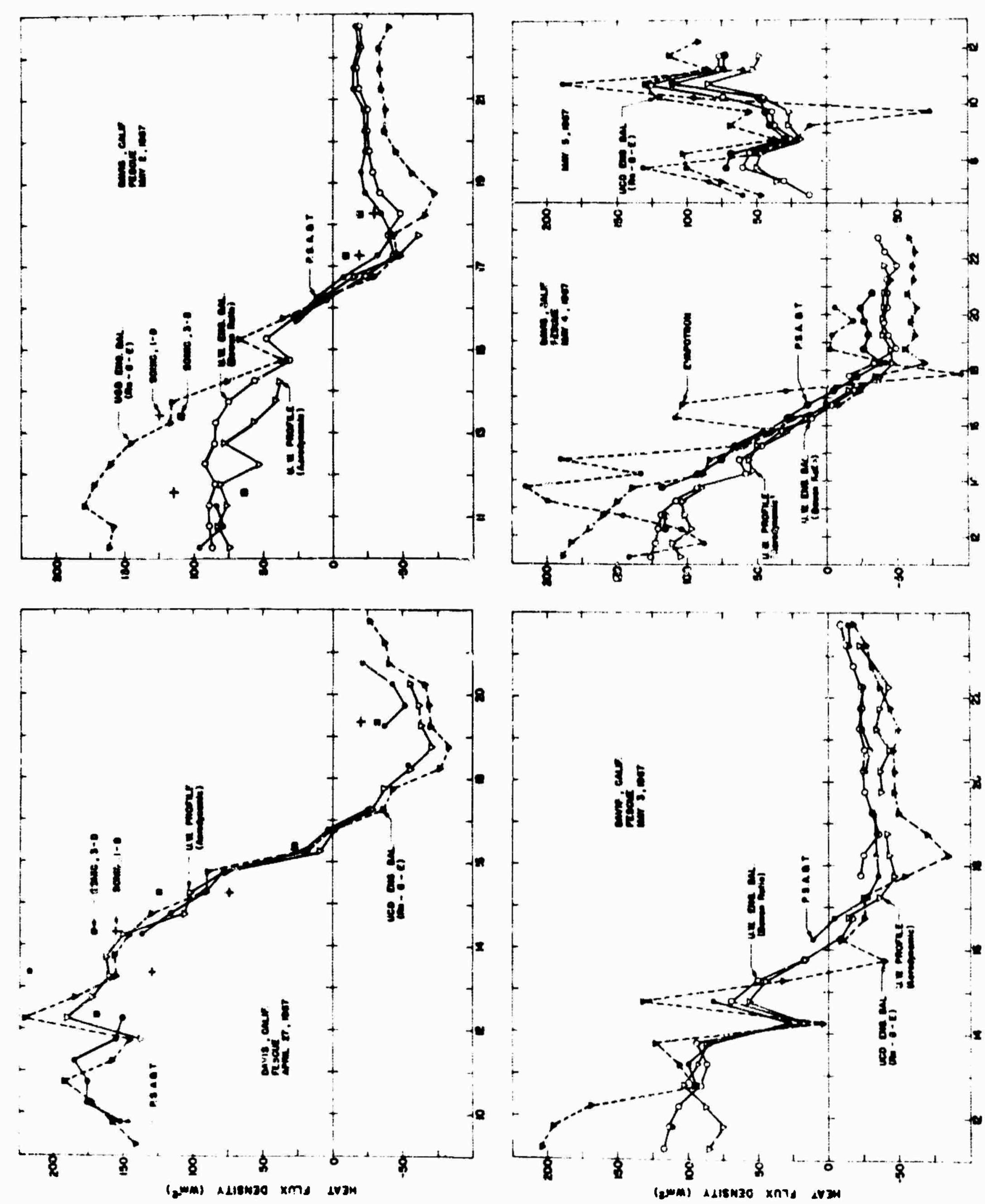


Fig. 3. Comparisons of heat flux density estimates at Davis, California for April 27, May 2, May 3, and May 4 and 5 of 1967.

sites frequently is of the same order as the difference between our data and that of the sonic anemometer-thermometer.

The eddy-flux from the Evapotron is shown on Fig. 3 for May 4 and 5. The wide fluctuations may have been due to the averaging process to remove the mean wind and temperature terms since a time constant of only one minute is used in this system.

Several indirect estimates of sensible heat flux are also shown in Fig. 3. The energy balance estimates obtained from differencing the energy balance $H = R_n - G - E$ appear high during the day and low at night. Since $|R_n|$ and $|E|$ are much larger than $|H|$, a small relative error in these terms could produce a large relative error in $|H|$.

The results from the Bowen ratio energy balance and those from the aerodynamic method are the averages of heat flux data from three sites. These methods are nearly independent, but not completely so, because they use the same temperature profiles. Both methods show remarkably good agreement with the P.S.A.T.

In Fig. 4 is shown the average of heat flux estimates at two P.S.A.T. sites. Both sites were 117 cm above the soil surface until 1030 when one site was moved to 210 cm above the surface. Since estimates of heat flux by the P.S.A.T. at 210 cm from the soil surface were not systematically different from the 117-cm high site, fetch was considered adequate. On another day, we compared measurements with one P.S.A.T. at 75 cm and the other at 117 cm and found no systematic differences.

The energy balance estimate of heat flux leads the P.S.A.T. estimate in the morning. This was probably due

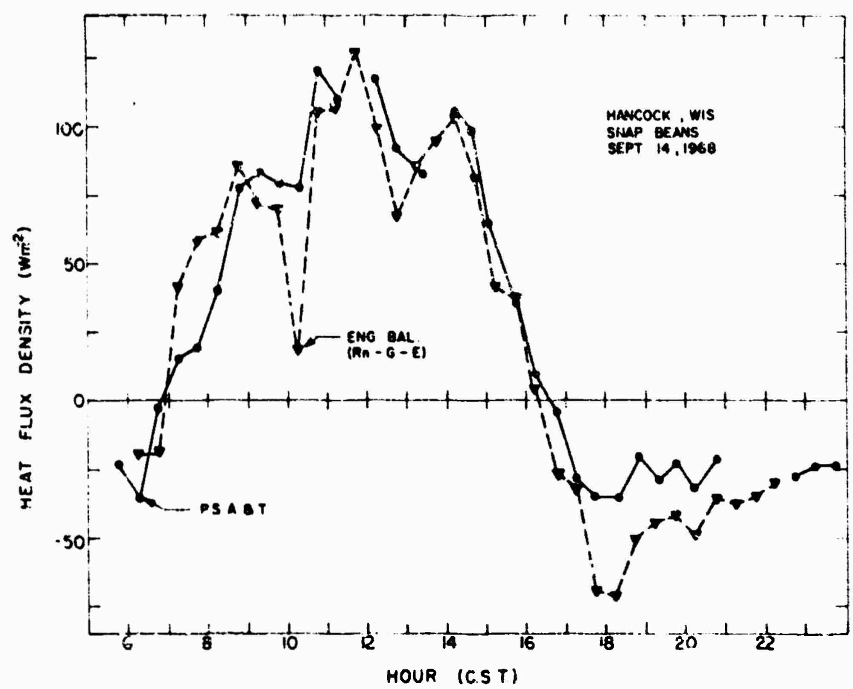


Fig. 4. Heat flux density estimates over snap beans.

to a time lag in the evaporative flux caused by unrepresentative heat storage in the lysimeter (Black, et al., 1968). This also could have caused an overestimate of the magnitude of the heat flux after sunset. The low value at 1015 was caused by an unexplainably large estimate of evaporative flux.

4. Temperature structure

When the data used in this section were collected, H and τ were constant with height, within the accuracy of our measurements; thus we can use H and τ as scaling factors as described by Monin and Obukhov (1954). They define a dimensionless height ratio z/L where z is the height from the surface and $L = -u_*^3 \rho c_p T/(kgH)$ [$u_* = (\tau/\rho)^{1/2}$ is the friction velocity; k = 0.428 is Karman's constant, and g = 980 cm sec^{-2}]. The relationships obtained between our measurements of z/L and our measurements of the correlation coefficients $r_{u,T}$ and $r_{w,T}$, and of the ratio $\overline{(u'T')}/\overline{(w'T')}$ are given in Fig. 5. Fig. 7 shows the relation of z/L to a dimensionless standard deviation of temperature, σ_T/T_* [σ_T is the standard deviation of air temperature and $T_* = -H/(k\rho c_p u_*)$].

It appears that $\overline{(u'T')}/\overline{(w'T')} \approx 4$ for z/L = 0.1 and ≈ 2.5 for z/L = -0.05. The large scatter indicates that more meaningful results might have been obtained from sampling periods shorter than the 30 min used. For instance, Zubkovskii and Tsvang (1966) obtain less scatter by using running means of the winds and temperatures from electrical filters with time constants of 100 sec and 80 sec, respectively. Fig. 5 shows that air temperatures are more closely coupled with horizontal winds than with vertical winds since $|r_{u,T}|>|r_{w,T}|$.

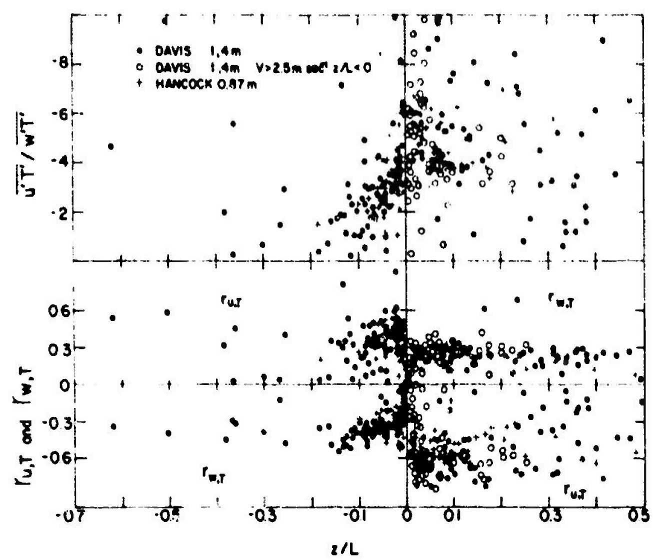


Fig. 5. Correlation coefficients of wind and temperature and $(\overline{u'T'})/(\overline{w'T'})$ as a function of stability.

This is especially true for stable conditions. As shown in Fig. 6, the fluctuations of air temperature and vertical wind during unstable conditions are much larger and faster than during stable conditions; however, it has been observed that slow wave motion (not evident in Fig. 6) frequently occurs at night when the wind speed is low. Then the temperature at a stationary height in a highly stratified atmosphere fluctuates as much as 3C every 50 to 200 sec, the period of the slow waves. This oscillation substantially increases σ_T and probably accounts for some small values of $r_{w,T}$ and $|r_{u,T}|$ for large positive values of z/L.

In Fig. 7, σ_T/T_* is plotted against z/L and appears to scale well for unstable conditions, except near $z/L = 0$, where $T_* = 0$. A function suggested by Dyer (1965) is drawn following Panofsky, et al., (1967). Data from Russian sonic anemometers and resistance thermometers (Mordukhovich and Tsvang, 1966) and data from a one-dimensional sonic anemometer-thermometer (Businger et al., 1967) are also included in Fig. 7. The P.S.A.T. data agrees well with the Russian data, but appears lower than the data summarized by Panofsky et al., (1967).

The large scatter for stable conditions may be caused in part by small absolute errors in τ and H, since both τ and H are about ten times smaller at night than during the day; however, slow wave motion may increase σ_T without increasing the heat flux enough to keep σ_T/T_* from increasing whenever these large-scale disturbances occur. Since Mordukhovich and Tsvang (1966) use a running mean of temperature with a time constant of 80 sec, temperature oscillations with periods longer than 20 sec are substantially attenuated, causing their

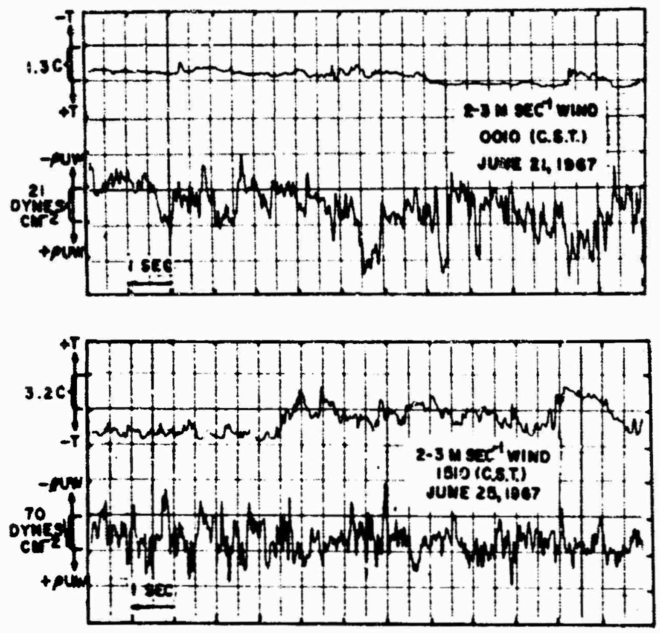


Fig. 6. Fluctuations of T and ρuw for stable conditions at 2.0 m (bottom) above bare Plainfield sand at Hancock, Wis.

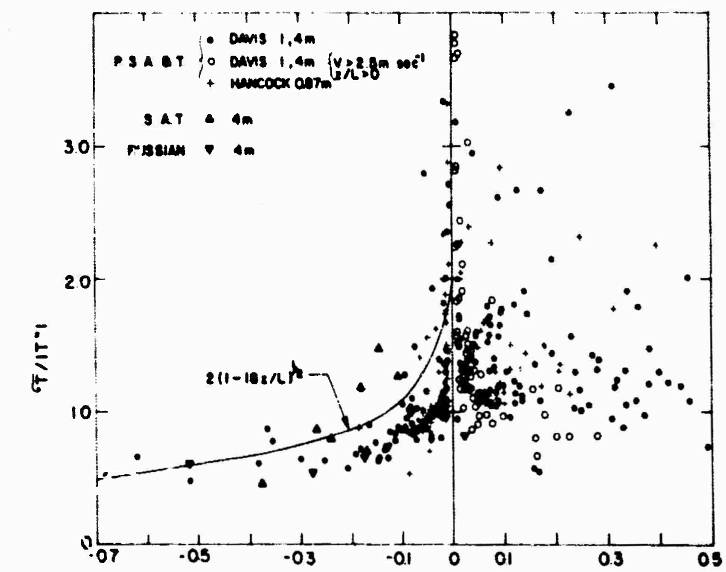


Fig. 7. Standard deviation of dimensionless temperature as a function of stability.

estimates of σ_T/T_* to have less scatter and be lower than our estimates. Measurements during stable conditions, when the wind speeds were at least 2.5 m sec^{-1} at 1 m, have less scatter; mixing is probably adequate then to prevent domination by large-scale disturbances.

REFERENCES

Black, T. A., G. W. Thurtell, and C. B. Tanner, 1968: Hydraulic load cell lysimeter, construction, calibration and tests. Soil Sci. Soc. Amer. Proc., 32, 623-633.

Businger, J. A., M. Miyake, A. J. Dyer, and E. F. Bradley, 1967: On the direct determination of turbulent heat flux near the ground. J. Appl. Meteor., 6, 1025-1032.

Dyer, A. J., 1965: The flux-gradient relation for turbulent heat transfer in the lower atmosphere. Quart. J. Roy. Meteor. Soc., 91, 151-157.

Dyer, A. J., and F. J. Maher, 1965: Automatic eddy-flux measurement with the evapotron. J. Appl. Meteor., 4, 622-625.

Fuchs, M., and C. B. Tanner, 1968: Calibration and field test of soil heat flux plates. Soil Sci. Soc. Amer. Proc., 32, 326-328.

Kaimal, J. C., and J. A. Businger, 1963: A continuous wave sonic anemometer-thermometer. J. Appl. Meteor., 2, 156-164.

Kaimal, J. C., J. C. Wyngaard, and D. A. Haugen, 1968: Deriving power spectra from a three-component sonic anemometer. J. Appl. Meteor., 7, 827-837.

Mitsuta, Y., 1966: Sonic anemometer-thermometer for general use. J. Meteor. Soc. Japan, 44, 12-23.

Monin, A. S., and A. M. Obukhov, 1954: Fundamental regularities of turbulent agitation in the ground layer of the atmosphere. Transactions of the Geophysical Institute of the Academy of Sciences, U.S.S.R., 24, 163-187.

Mordukhovich, M. I., and L. R. Tsvang, 1966: Direct measurement of turbulent flows at two heights in the atmospheric ground layer. Izv. Atmos. Oceanic Phys., 2, 786-803.

Panofsky, H. A., N. Busch, B. Prasad, S. Hanna, E. Peterson, and E. Mares, 1967: Properties of wind and temperature at Round Hill, South Dartmouth, Mass. Pennsylvania State University Tech. Rept. ECOM-0035-F. U. S. Army Electronics Command Grant DAB07-67-0035, 95 pp.

Pruitt, W. O., and D. E. Angus, 1960: Large weighing lysimeter for measuring evapotranspiration. Trans. Amer. Soc. Agric. Eng., 3, 13-15.

Tanner, C. B., 1958: Soil thermometer giving the average temperature of several locations in a single reading. Agron. J., 50, 384-387.

Thurtell, G. W., C. B. Tanner, and M. L. Wesely, 1969: Three-dimensional pressure-sphere anemometer system. J. Appl. Meteor., 8 (submitted).

Wesely, M. L., G. W. Thurtell, and C. B. Tanner, 1969: A fast-response thermometer for eddy correlation measurements. J. Appl. Meteor., 8 (submitted).

Zubkovskii, S. L., and L. R. Tsvang, 1966: Horizontal turbulent heat flow. Izv. Atmos. Oceanic Phys., 2, 1307-1310.

EVAPORATION MEASUREMENTS BY AN EDDY CORRELATION METHOD

S. M. Goltz

C. B. Tanner

G. W. Thurtell

F. E. Jones[1/]

[1/] F. E. Jones is with Institute for Basic Standards, National Bureau of Standards, Washington, D. C. 20234

ABSTRACT

Eddy correlation measurements of water vapor flux density have been made using a barium fluoride film humidity sensor. During morning and evening periods, good agreement was obtained between eddy correlation data and two independent methods. Serious disagreement between measurements occurred only when the humidity sensor was operating within a poorly defined portion of the calibration curve which was not suited to on-line calculations. The results indicate that the humidity sensor could be modified to allow operation at all times within well defined segments of the calibration curve and permit successful eddy correlation vapor flux measurements within one meter of the surface. (Key Words: Humidity sensor; eddy correlation; vapor flux)

Introduction

Of the micrometeorological methods currently available for determining evaporation, the eddy correlation approach is most satisfying since it requires the least number of basic assumptions. The equation which describes the evaporation as latent heat flux density, may be written as

$$F_v = \lambda \, [\bar{q} \, \bar{w} + \overline{q'w'}] \tag{1}$$

where λ is the latent heat of vaporization, q is vapor concentration (absolute humidity) and w is the vertical wind velocity. The overbars indicate time averages and the primes indicate fluctuations about the mean. The surface evaporation, E, will be equal to

$$E = \lambda \, [\overline{q'w'}] \tag{2}$$

when $\bar{w}$ is equal to zero.

Although eddy correlation measurements of sensible heat flux have been made [Kaimal and Businger, 1963; Businger, et al., 1967; Wesely, Thurtell, and Tanner, 1969] evaporation measurements have been limited by slow humidity sensors. Dyer and Hicks [1967] and Goddard and Pruitt [1966], using fine-wire psychrometers, found that measurement at four meters was necessary where larger and slower eddies could be recorded by these relatively slow elements. At these elevations, however, storage and advection errors occurred unless there was a very long fetch. In order to work closer to the ground, we have investigated the possible

use of a rapid-response barium fluoride film humidity sensor [Jones, 1967]. Bean and Florey [1968] report on the use of this sensor for measuring evaporation at two meters above Lake Hefner. However, their system was limited by the relatively slow response of an anemometer-bivane and not by the humidity element's response. We believe that in association with a fast response wind vector sensor the barium fluoride film humidity sensor can allow measurement of evaporation considerably closer to the surface.

Instrumentation and Methods

Barium fluoride film humidity sensor. The barium fluoride humidity sensor consists of a glass plate of approximately 10 x 2 x 0.16 cm on which a 0.3μ-thick film of barium fluoride has been evaporated over closely-spaced, evaporated chromium electrodes. The electrical resistance is measured between the electrodes. Jones [1967] reports in detail on these sensors and their properties.

The particular elements used in the present work are calibrated by determining their resistances over a series of known relative humidity solutions from 12 to 97%. Plots of the logarithm of sensor resistance against relative humidity consist of three linear segments. Unfortunately, sensor calibration is not stable for an unlimited time and degrades substantially over a period of several months. Calibration curves indicating changes over time are shown in Figure 1.

In order to use relative humidity measurements in the eddy correlation method, a reference temperature must be measured. During preliminary tests at Davis, California

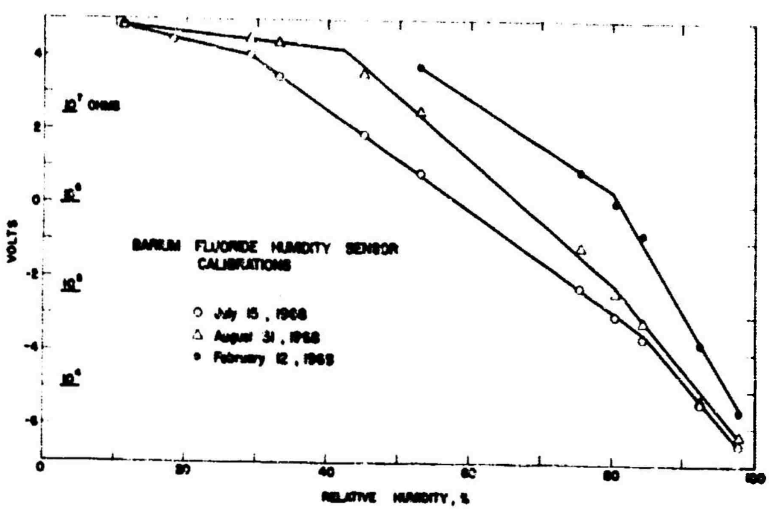


Fig. 1. Calibration curves for a barium fluoride film humidity sensor showing changes with time.

in 1967, we used the air temperature; the results showed that the sensor film temperature should be used as the reference for converting relative humidity to absolute humidity and must be monitored. Accordingly, a 127μ micro-bead thermistor is cemented with a very small amount of clear epoxy to the center of the sensitized surface. A linearized bridge is used with the thermistor for the surface temperature measurement.

The sensors also have electrical leads cemented to them. Vapors from the epoxy used to attach the leads and thermistors caused an immediate calibration shift, and it is possible that the drifts shown in Figure 1 were accelerated by the early exposure to organic vapors.

Electronic circuitry. A block diagram of the circuit used with the barium fluoride humidity sensor and its associated thermistor is shown in Figure 2. The two most important features of the system are the logarithmic amplifier and the phase adjustment. The logarithmic amplifier provides an output voltage that is linear with relative humidity as shown in Figure 1. The phase adjustment is necessary because at low humidities, and with very high sensor resistances, there is significant capacitive reactance. The phase is adjusted to null the capacitive reactance while the sensor is at very low humidity over a desiccant; no further adjustment is required throughout the full humidity range. The capacitive reactance is associated with the linear segment at the lowest humidities of the calibrations curves of Figure 1. The importance of this segment with its relatively flat slope and its shift to higher relative humidity ranges with time becomes a problem as discussed later.

Eddy correlation system. The fluctuating wind vector needed in (2) is measured with the pressure sphere anemometer,

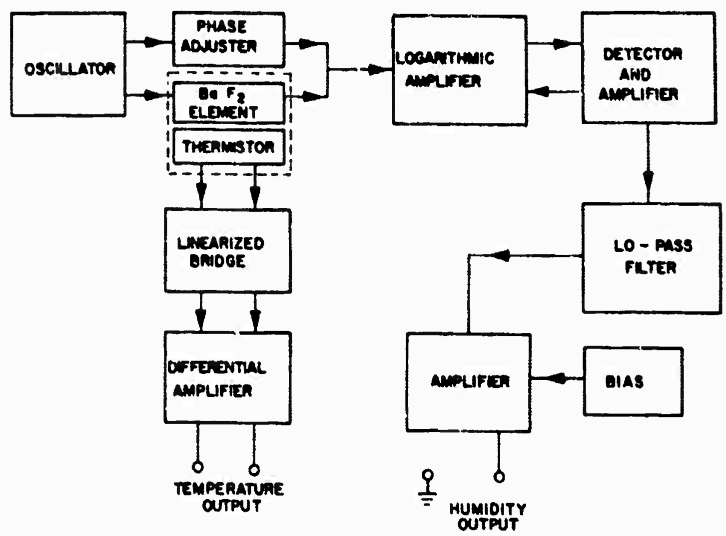


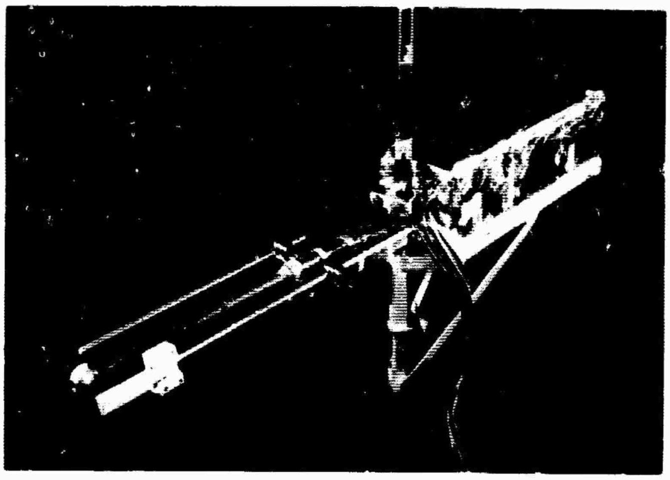
Fig. 2. Block diagram of circuit used with barium fluoride film humidity sensor and its associated thermistor.

details of which are reported by Thurtell, et al., (1969). The barium fluoride humidity sensor is mounted to the side of pressure sphere anemometer and a fine-wire resistance thermometer is mounted on the other side (Figure 3). The thermometer provides air temperatures which, when used in the heat equation analogous to that of (2), gives the sensible heat flux density (Wesely, et al., 1969). Figure 4 gives a plan view of locations of the various components. In addition, and not shown in Figures 3 and 4, a small sunshade was elevated 15 to 20 cm above the humidity sensor. The shade was used since radiational heating often caused sensor temperatures to rise as much as 10 C above air temperature, which, in turn, caused the effective relative humidity of the sensor to fall into its least sensitive, very dry, range (above or near knee in Figure 1).

We anticipated that the spatial grouping of sensors was small enough and the sensors had sufficiently high frequency responses to measure transport occurring in small, high-frequency eddies found within one meter of the surface.

Calculations were made on-line by transmitting analog voltages of relative humidity, sensor surface temperature, and anemometer pressures to an analog to digital converter and an Electro-Mechanical Research 6130 computer (8001 Bloomington Freeway, Minneapolis, Minn. 55420) housed in an instrument trailer. Sampling rate was 150 times per second with data acquisition for 28.5 minutes of each half hour and summary data calculations and typewriter output for the remainder of the time.

A servo-mechanism rotated the instrument system assembly into the wind as wind direction changed. Therefore,



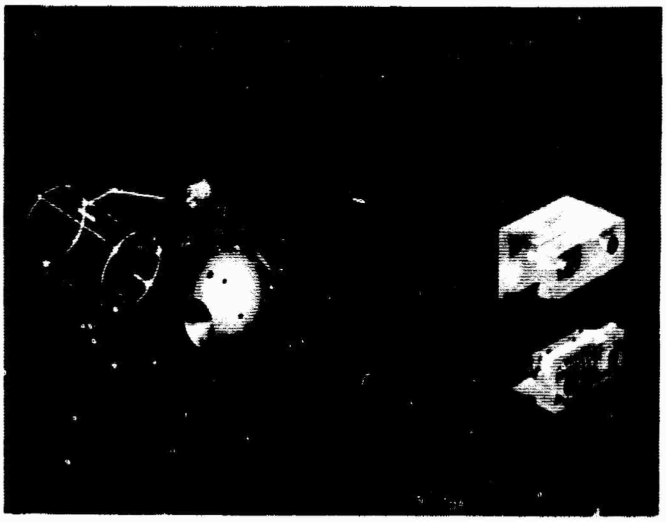


Fig. 3. (<u>Upper</u>) Entire eddy correlation system.

(<u>Lower</u>) Close view of sensors.

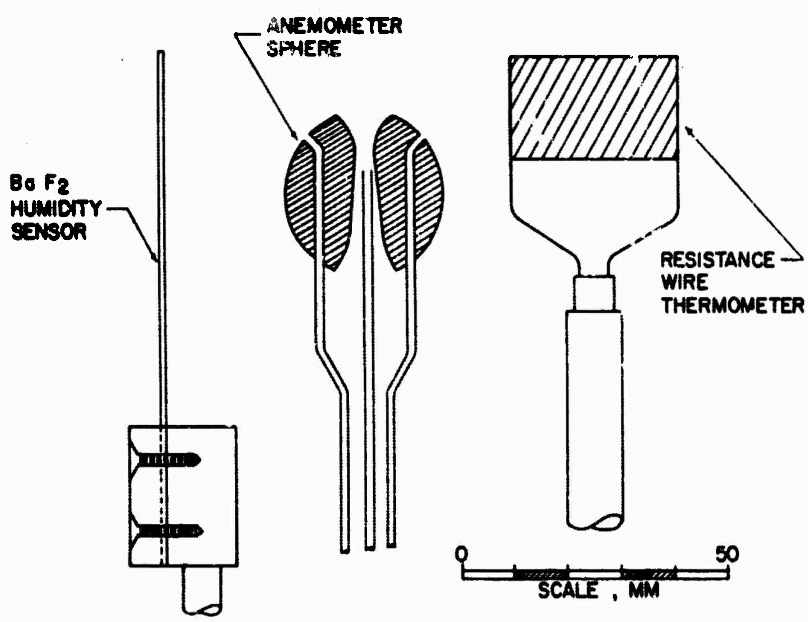


Fig. 4. Plan of system components.

data was acquired automatically, except for sunshade adjustment, gain adjustments, and equipment maintenance which were done during data printout.

Field trial site. During September 1968, vapor flux measurements were made at Hancock, Wisconsin over snap beans (Phaseolus vulgaris), which were 30 cm high. A pressure sphere anemometer with humidity sensor was located 60 m south of the instrument trailer with a bean fetch of 60 m to the north, 50 m to the east and west, and 100 m to the south. A 100 m to 200 meter fetch of alfalfa-brome pasture extended beyond the beans to shelter belts which were 15 meters high. A second anemometer without a humidity sensor was located 10 m west of the previously described site.

The instruments at the humidity sensor site were at an initial elevation of 1.17 m above ground surface. This elevation was maintained until 1030 on the 14th when it was raised to 2.10 m. The 2.10 m elevation was lowered to 0.75 m following 0630 on September 15. On September 20 the elevation was 1.17 m. The changes in elevations were used to try to detect the affect of eddy size and frequency on sensor response.

Additional site instrumentation provided two other measurements of latent heat flux density for comparison with the eddy correlation data. One was evapotranspiration measured with a hydraulic load-cell lysimeter [Black, et al., 1969]. The other measurement was made using the energy balance equation

$$E = R_n - G - H_a \tag{3}$$

The net radiation, R_n, was measured with a Funk net

radiometer, the soil heat flux density, G, was measured using soil heat flux plates in conjunction with thermometers, while the sensible heat flux density, H_a, was obtained from the average of the two eddy correlation measurements [Wesely, et al., 1969].

Results

Half-hourly values of latent heat flux density from (2), (3), and the lysimeter are compared in Figure 5 for September 12, 13, 14, and 20. On September 20 energy balance data were unavailable. This figure also shows half-hourly mean values of relative humidity as measured by the barium fluoride sensor and wind speed measured by a cup anemometer mounted at 1.32 m approximately 25 m southwest of the eddy correlation sites.

Several conclusions can be drawn from these comparative data. First, there is excellent general agreement both in trends and in magnitude between the lysimeter and the energy balance data; this confirms the validity of our independent measurements used for comparisons. Secondly, for the most part, the eddy correlation data prior to 1000 and past 1600 on each day show good agreement with the other two sets of evaporation data, while during the mid-day period they are one-half to one-third the other data. Thirdly, during data collection at elevations of 1.17 m to 2.1 m, no apparent systematic differences could be detected in sensor response by comparison with the independent methods. Figure 5 presents no data for the 0.75 m elevation since only two hours of morning data were collected, but these limited data are also in good agreement with the independent measurements. Fourthly, although wind speed is correlated with eddy

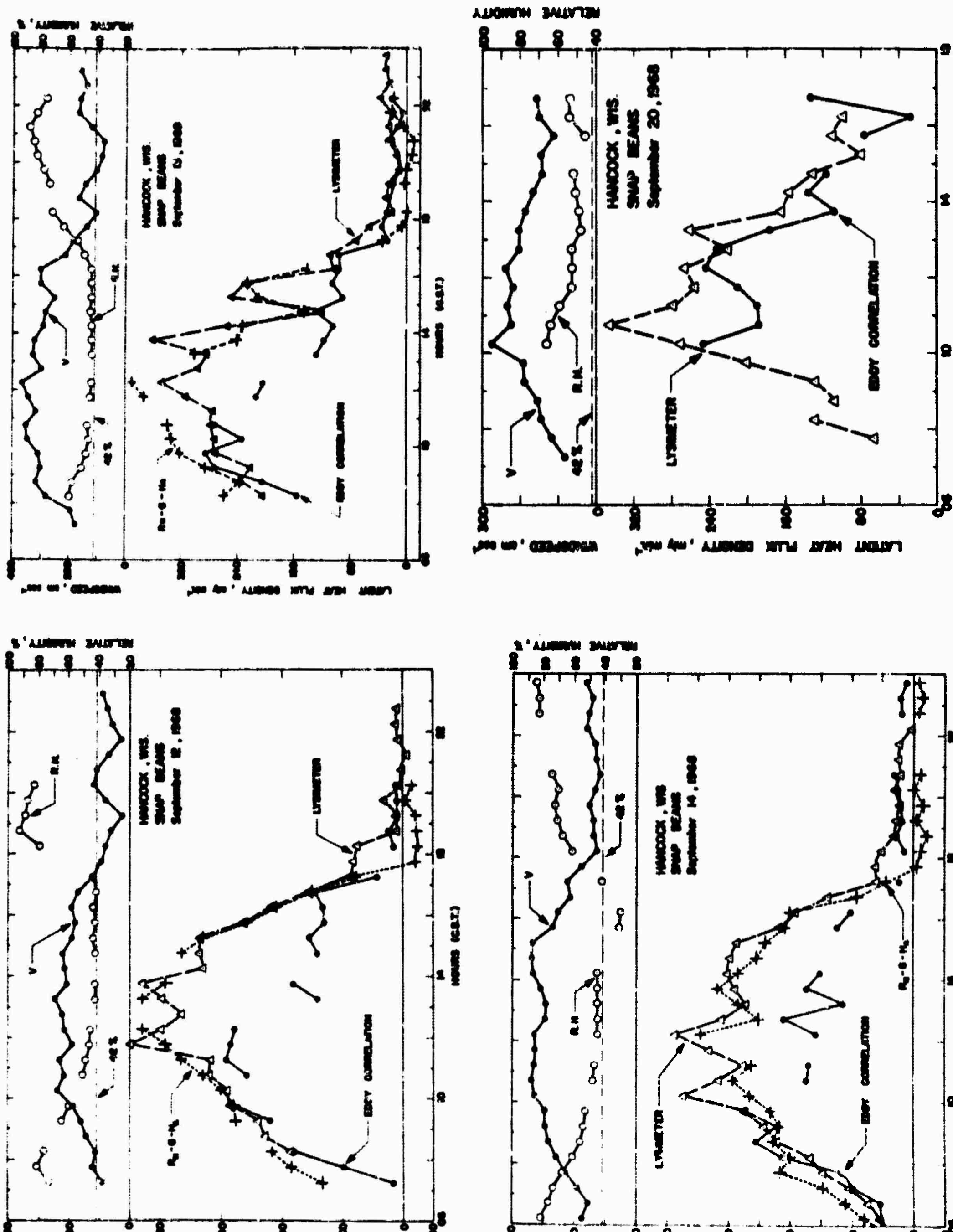


Fig. 5. Diurnal trends of latent heat flux density from eddy correlation measurements, from energy balance and lysimeter data, and diurnal trends of windspeed and relative humidity.

frequency, there was no association between periods of either good or poor agreement and windspeed. Finally, there is a strong correlation between periods of poor agreement and mean relative humidities, as seen by the sensor, of less than about 45 percent.

In Figure 1 the August 31, 1968 calibration curve shows a sharp break in slope at 42 percent relative humidity. This critical value was determined by extrapolation, while the actual change was most probably a gradual one over a ΔRH range of 8 to 10 percent. The slope of the calibration curve is one of the constants required for the on-line computer program, and during periods when the mean relative humidity was near the knee of the calibration curve, vapor flux density could not be satisfactorily computed. Figure 5 shows that all periods of poor agreement occur when the mean relative humidity was less than or only slightly in excess of the critical value, 42 percent. A portion of this decrease in sensor-perceived relative humidity during mid-day periods is attributed to radiational heating. As wind direction and sun angle varied, the small sunshade in a fixed position relative to the humidity sensor frequently did not shade the sensor. Visual inspection of shade orientation and adjustment of its position were possible only in the 1.5-min intervals at the end of each half-hour, and not during data collection.

The pressure sphere anemometer measurements associated with the humidity sensor gave a lower mean horizontal wind, and more negative $\rho \overline{w'v'}$ than those from the anemometer without a humidity sensor attached. We doubt that this was due to spatial heterogeneity of the row crop; it most likely was due to locating the barium fluoride element

too far forward (see Figure 4) where it interferred with the wind flow when wind was from the side. Any errors in the cross-wind measurement affect the wind coordinate transform.

Recommendations

The field measurements indicate that the barium fluoride film humidity sensor has sufficiently rapid response to allow reliable eddy correlation measurements of vapor flux within a meter or less of the surface. Modifications to the present system should be: (1) The sensor configuration should be changed from a plate to a cylinder, with cooling tubes inside the cylinder to maintain the sensor at or below ambient air temperature. Such a change would permit temperature control of the sensor so that the operating point on the calibration curve could be kept away from any "knee". The cylindrical configuration also should affect air flow around the sphere less than the plate. (2) Since the sensor calibration is altered by contamination with time, BaF_2 films should be applied as close as possible to time of use. The BaF_2 should be coated on elements to which thermistor and leads have been attached previously. Films should be recalibrated frequently during field use. (3) Further tests should be made of the optimum sensor location with respect to the pressure sphere to assure minimum interference. Certainly the forward end of the sensor should be behind the sphere. (4) Frequency characteristics of the sensor should be established to allow matching amplitudes and phase shifts to the wind measuring system.

REFERENCES

Bean, B. R. and Q. L. Florey, A field study of the effectiveness of fatty alcohol mixtures as evaporation reducing monomolecular films, Water Resources Res., 4, 206-208, 1968.

Black, T. A., G. W. Thurtell, and C. B. Tanner, Hydraulic load cell lysimeter, construction, calibration, and tests, Soil Sci. Soc. Amer. Proc., 32, 623-629, 1968.

Businger, J. A., M. Miyake, A. J. Dyer, and E. F. Bradley, On direct determination of the turbulent heat flux near the ground, J. Appl. Meteorol., 6, 1025-1032, 1967.

Dyer, A. J. and B. B. Hicks, The fluxatron -- a revised approach to the measurement of eddy fluxes in the lower atmosphere, J. Appl. Meteorol., 6, 408-413, 1967.

Goddard, W. B. and W. O. Pruitt, Mass transfer-eddy flux methods, 42-44, in Evapotranspiration and its role in water resources management, Conf. Proc. Publ. by Amer. Soc. Agr. Eng., St. Joseph, Mich., 1966.

Jones, F. E., Study of the storage stability of the barium fluoride film electric hygrometer element, J. Res. NBS, 71C, 199-207, 1967.

Kaimal, J. C. and J. A. Businger, A continuous wave sonic anemometer-thermometer, J. Appl. Meteorol., 2, 156-164, 1963.

Thurtell, G. W., C. B. Tanner, and M. L. Wesely, Three-dimensional pressure-sphere aneometer system, J. Appl. Meteorol., 8, (Submitted), 1969.

Wesely, M. L., G. W. Thurtell, and C. B. Tanner, Eddy correlation measurements of sensible heat near the earth's surface, J. Appl. Meteorol., 8, (Submitted), 1969.

A FAST-RESPONSE THERMOMETER FOR EDDY CORRELATION MEASUREMENTS.

M. L. Wesely, G. W. Thurtell, and C. B. Tanner

Eddy-correlation measurements of sensible heat flux close to the earth's surface require fast-responding, small thermometers; these can be made with fine resistance wire. Resistance thermometers with 13 μ diameter (e.g. McIlroy, 1955; Dyer and Maher, 1965; Hyson, 1968) have better frequency response and lower radiation errors than the commercially-available thermocouples which are 25 μ wire and may have junctions larger than 25 μ. If the resistance wire is less than 13 μ in diameter, the frequency response and radiation error is still less dependent upon wind speed than with 13 μ wire, and radiation error decreases. Because very fine wire thermometers have small radiation error, they can be used to measure average vertical temperature differences without radiation shielding or aspiration; however, in this instance the rapidly fluctuating thermometer output is filtered electrically.

The purpose of this note is to describe a fast, very fine wire thermometer which is constructed easily and which we have found useful for eddy correlation measurement within 0.5 to 1.0 m of the earth's surface (Wesely, et al., 1969).

1. Description and construction of the thermometer

The supporting structure of the thermometer, as pictured in Figs. 1 and 2, consists of the frame, the insulating plug, and the stainless steel supporting tube. The thermometer element consists of about 55 cm of platinum-coated, 5.6 μ-diameter, tungsten wire[1/] wound

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[1/] Sigmund Cohn, Mount Vernon, N. Y. (0.00022-inch diameter, with about 4 to 7% weight platinum coating).

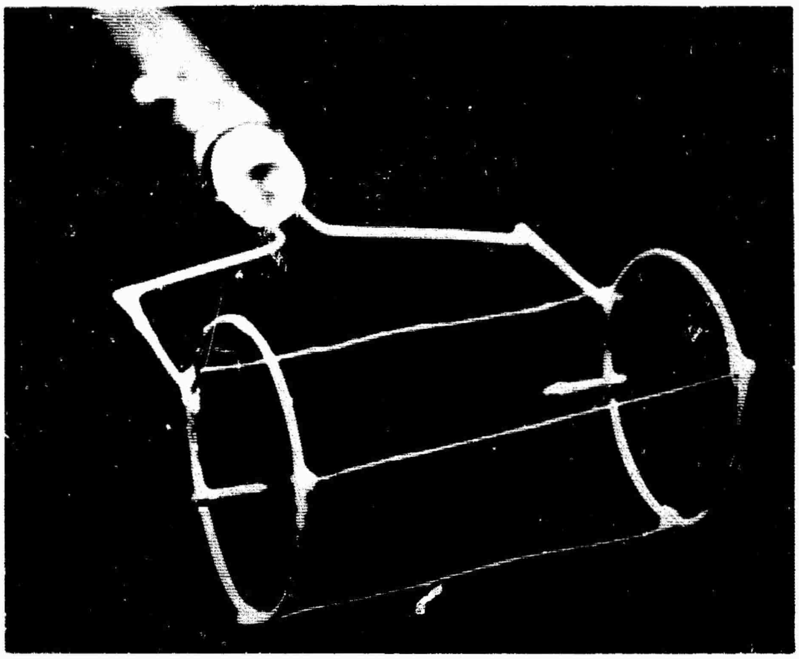

Fig. 1. Front view of the resistance thermometer.

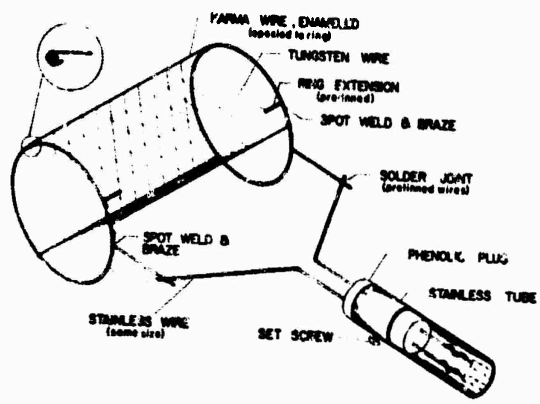

Fig. 2. Resistance thermometer details.

on the frame as shown.

a. <u>Thermometer frame</u>

The frame consists of three 0.16 mm (0.0063 inch) enameled Karma[2/] wires which were epoxied to two rings constructed from 0.66 mm (0.0253 inch) stainless steel wire. These rings are 1.9 cm in diameter and spaced 3.2 cm. The resistance wire is soldered to two inward extensions of the rings. The rings and their extensions serve as electrical connections and provide mechanical support.

The rings are formed on a mandrel and spot-welded. The extensions are spot-welded to the rings and all the spot-weld joints are hard soldered. The extensions are pretinned[3/], which requires acid flux; when once pretinned future soldering operations may be done with neutral and rosin fluxes. Following pretinning, the stainless steel and any parts exposed to acid flux fumes must be thoroughly cleansed with soapy water and rinsed in distilled water.

2/ Driver Harris Co., Harrison, N. J.

3/ Eutectic Welding Alloys Corporation, Flushing, N. Y., EutecRod 157; All-State Welding Alloys Co., White Plains, N. Y., #430 solder.

b. Frame support

The frame support consists of the stainless steel tube (9.5 mm O.D. x 1.58 mm wall) and the insulating plug, which is held in the tube with a set screw. Two 0.66 mm diameter stainless steel leads are pretinned[3], washed, and epoxied in holes drilled in the plug. The stainless wires extend inside the tube, where they are soldered to copper leads and covered by heat-shrink tubing.

c. Winding the resistance wire

Tungsten was chosen as a thermometer wire because of its high tensile strength, but due to the small wire diameter, a load of only seven grams will break it. The wire is best seen against a dark background with proper lighting. When the resistance wire is wound on the frame, the frame is attached with clips to the end of a threaded arbor which has a pitch of 2.5 mm and which is fixed in a threaded nut. About 65 cm of the resistance wire is unspooled and cut with masking tape folded to the ends so it may be held. One end is soldered to one of the pretinned frame extensions and the other end, weighted with the masking tape, hangs free. As the arbor is turned the resistance wire is pulled through a stationary feed (needle with eye enclosure cut away) and wrapped around the frame, automatically spacing the windings at least 2.5 mm apart. Closer spacing may cause adjacent resistance wires to touch if the Karma wire flexes slightly. When ten windings are on the frame, the free end of the wire is soldered to the second extension. Before the wire is wound on the frame, the Karma cross-struts are coated either with

epoxy or with a silicone-base contact cement[4/] to prevent the tungsten wire from sliding on the strut.

The platinum-coated tungsten resistance wire is soldered with a sonic soldering iron without flux to the pretinned frame extension using indium solder[5/]. If a sonic soldering iron is not available, either a cut-acid, zinc chloride flux or an All-State neutral 420 flux can be used with the indium solder; however, the fluxless joint made with a sonic iron is preferable since no electrolytes are introduced. Satisfactory solder joints cannot be made with tungsten wire that is not coated with solderable metals.

To prevent misalignment of the fragile assembly after winding the wire, the frame should be attached immediately to the frame support.

2. Frequency response and radiation heating

Chao and Sandborn (1964) show that a resistance wire thermometer responds to a temperature change as a first-order system. For first-order systems the amplitude ratios and phase shift angles, θ, with sinusoidally fluctuating air temperatures are:

$$A/A_0 = (1 + \omega^2\tau^2)^{-\frac{1}{2}} \qquad (1)$$

$$A/A_0 = \cos\theta \qquad (2)$$

4/ Mystik Tape, Inc., 1700 Winnetka Ave., Northfield, Ill. (Type A-117)

5/ Indium Corporation of America, Utica, N. Y., Indalloy solder #4, indium metal.

where τ is the time constant, ω is angular frequency, and A_0 is the output amplitude when $\omega = 0$.

Chao and Sandborn derive an expression for the time constant of a resistance wire, neglecting radiation exchange.

$$\tau^{-1} = (k/\rho C)(\pi/L)^2 + (4/D^2)(hD)/\rho C)$$
$$- (K/\rho C)(4/\pi D^2)^2 I^2 \quad (3)$$

where k is the thermal conductivity of the wire, I the current through the wire, L and D are the wire length and diameter, ρ and C are density and specific heat of the wire, K is the wire resistivity, and $h = (k_a/D) N_u$ where k_a is the thermal conductivity of air. The Nusselt number, Nu, for air in transverse flow can be found from

$$Nu = 0.3 + 0.51 Re^{\frac{1}{2}} \quad (4)$$

where Re is the Reynolds number. According to Grant and Kronauer (1962), the Nusselt number for our extremely fine, long wire would be slightly less than 0.3 in still air; however (4) is a sufficiently good approximation to calculate performance for field experiments.

The first term in the right side of (3) represents internal conduction along the wire to the supports and is negligible for long wires. The second term is proportional to the convection from the wire per unit temperature difference and is much larger than the last term, which indicates how the temperature of the wire

affects the time constant. When all of the values for our resistance wire are inserted into (3), it simplifies to:

$$\tau = 1/(1530\ \mathrm{Nu} + 5.8) \qquad (5)$$

For a given wind velocity, (5) can be used to calculate τ for the resistance wire; then (1) can be used to find the ratio of the amplitudes for a given frequency and (2) will give the phase shift. For the resistance wire used in the thermometer, the time constant was calculated to be about 1.5 msec in "still" air and 0.6 msec in 10 m sec^{-1} winds. In a laboratory relatively free of air currents, the time constant of the thermometer was observed to be about 1 msec. Up to a frequency of 20 Hz, reduction in amplitude should be less than 2% and phase shift about 10 deg. Even at 50 Hz, less than 10% reduction is amplitude and a phase shift less than 25 deg is expected.

The frequency response may be decreased and the phase shift may be increased by electrically filtering the analog signal from the thermometer bridge. This is necessary to match the response of a wind-measuring system when eddy correlation measurements are made or to average the signal when temperature gradients are measured. An advantage of the fine wire is that the effect of the wind speed upon τ is negligible compared to the total phase shift and degraded frequency response needed to match most eddy correlation wind systems.

Solar heating of the fine resistance wire on the thermometer must be dissipated by convective transport. Neglecting other sources of heating, the steady state

energy balance can be expressed as

$$R_s(1-a_s)DL = hD\pi L(T-T_a) \qquad (6)$$

where R_s is the solar radiation and a_s is the absorptivity for solar radiation. Since this equation is for the radiation being absorbed uniformly over the entire cross-section of the wire and no radiation losses, the calculated temperature difference will be an overestimate.

Using an extreme value of 1400 W m^{-2} for R_s and 0.5 for a_s temperature differences for the fine resistance wire are about 0.15C in still air, 0.09C in 0.5 m sec^{-1} wind, and 0.05C in a 5 m sec^{-1} wind. Thus, it is conceivable that radiation could cause the wire to heat up as much as 0.1C, but a wind gust would not change this offset by more than a few hundredths of a degree Celsius. This change is negligible for eddy heat flux calculations, and often is not significant when mean air temperature differences are needed, provided all the thermometers are exposed equally to radiation.

3. Bridge design criteria

The temperature coefficient of resistance of the wire was determined by measuring the thermometer resistance in a temperature-controlled kerosene bath; it was found to be 0.360% C^{-1} at 20C, and 0.350% C^{-1} at 30C. The 55 cm of resistance wire wound on each thermometer spool had a total resistance of about 1550 ohms, which increased with temperature at the rate of about 5.5 ohms C^{-1} at 25C.

The thermometer is measured in a constant-current bridge, with the current low enough for negligible

self-heating. Since the Nusselt number calculated by (5) for 5.6 μ wire only doubles as the wind velocity changes from still air to a 5 m sec^{-1} wind, the effect of convective heat transfer on self-heating is weak. In still air, the maximum current allowable for less than 0.01C temperature rise is 0.33 ma. This value increases to 0.35 ma in a 0.5 m sec^{-1} wind, and to 0.50 ma in a 5 m sec^{-1} wind. If the current were 0.30 ma, the temperature difference would be less than 0.01C and would change by about 0.004C as the wind changed from 0.5 m sec^{-1} to 5 m sec^{-1}.

In our bridge we use a 16.2 V mercury battery (two 8.1 V, TR-236R) across a 40 k ohm resistance in series with the thermometer. Fixed resistors of similar value and a potentiometer for balancing form the other half of the bridge. The bridge output is 0.60 C mv^{-1}. When two thermometers are used to measure vertical temperature differences for Bowen's ratio measurements the second half of the bridge also is a 40 k ohm resistance in series with the thermometer; the 40 k ohm resistance is comprised of a fixed resistor and a potentiometer to obtain balance. When used for measuring vertical temperature differences, the thermometers are mounted on a stand which interchanges their position periodically to obviate zero errors (Sargeant and Tanner, 1967).

REFERENCES

Chao, J. L., and V. A. Sandborn, 1964: A resistance thermometer for transient temperature measurements. Fluid Mechanics Paper No. 1, Colorado State University, Fort Collins, Colo.

Dyer, A. J., and F. J. Maher, 1965: Automatic eddy-flux measurements with the evapotron. J. Appl. Meteor., 4, 622-625.

Hyson, P., 1968: The tungsten wire temperature sensor. J. Appl. Meteor., 7, 684-690.

McIlroy, I. C., 1955: Australian J. Agr. Res., 6, 196-199.

Sargeant, D. H., and C. B. Tanner, 1967: A simple psychometric apparatus for Bowen ratio measurements. J. Appl. Meteor., 6, 414-418.

Wesely, M. L., Thurtell, G. W. and C. B. Tanner, 1969: Eddy correlation measurements of sensible heat flux near the earth's surface. J. Appl. Meteor., 8, (Submitted)

SENSIBLE HEAT FLUX MEASUREMENTS
WITH A YAW SPHERE AND THERMOMETER

C. B. Tanner and G. W. Thurtell

1. Introduction

A yaw sphere, shown schematically in Fig. 1, when directed into the wind flow, generates a pressure between the ports proportional to the product of the horizontal and vertical winds. If this pressure is measured with an electrical pressure transducer and if the analog pressure signal then is passed through a high-pass filter to drive a resistance thermometer bridge, the bridge output is proportional to $\bar{u}(w'T')$. The sensible heat flux density can be determined by integrating the bridge output and dividing the mean, $\bar{u}(\overline{w'T'})$, by the mean wind speed measured with a nearby cup anemometer.

The objective of this note is to describe this analog system for sensible heat flux measurement and to present some comparisons with independent measurements of sensible heat flux density.

2. Equipment description

The description of the equipment is helpful to a discussion of the theory and is given first.

a. Yaw sphere, vane, and pressure system

The yaw sphere was made by drilling two 1.59-mm holes off-center through a 5-cm plastic sphere so that the included angle, θ, between radius vectors to holes on the sphere surface was 45°. The sphere was mounted on a 6.35-mm O.D. tubular stem inserted in the head of a Gill propeller vane where the propeller normally mounts, (Fig. 1). Two 1.59-mm I.D. polyethylene tubes were run through the stem and down the center of the hollow, rotating shaft in the Gill propeller vane that drives the azimuth potentiometer. These polyethylene tubes were

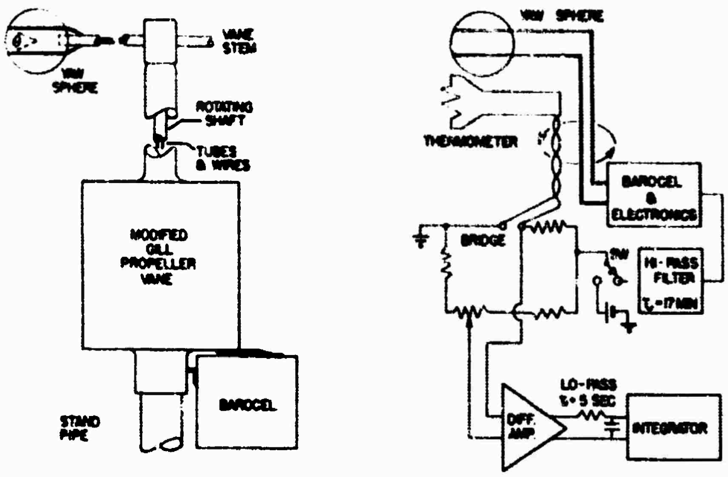

Fig. 1. Schematic of the yaw sphere on a vane and of the recording system.

brought out through the bottom of the vane housing and attached to a Datametrics, Model 511-8 Barocel capacitive pressure transducer. A 1-m length of 1.59-mm I.D. tubing was required to connect each sphere port to the pressure transducer. A fast resistance thermometer (Wesely, et al., 1969a) was mounted on vane head and located at the side of sphere as described by Wesely, et al. (1969b). The thermometer leads were run in parallel with the pressure tubing out the bottom of the vane housing to the thermometer bridge.

Although Wesely, et al. (1969b) adjusted the frequency response of the thermometer bridge amplifier to match that of their pressure-sphere anemometer, this would have complicated our simple analog system; accordingly the yaw-sphere and thermometer have different phase and frequency response. The frequency response of the yaw sphere is indicated in Table 1. The thermometer relative amplitude at 20 Hz is about 0.98 with 1 m sec^{-1} winds and the phase shift is about 10^{o}. Details of the pressure transducer system and frequency response calibration methods can be found in Thurtell, et al. (1969).

Table 1. Frequency response of the yaw sphere, tubing and Barocel.

Frequency, Hz:	2	4	10	15	20
Relative amplitude:	1.0	1.0	0.83	0.63	0.46
Phase shift, degrees:	5	15	35	50	60

b. <u>Electronics and recording</u>

The output from the Barocel and its signal conditioner is the electrical analog of the pressure, ΔP, between the yaw sphere ports. This signal is passed through a high-

pass filter with a 17-min time constant and unity gain. The output of the high-pass filter is an analog of $(\Delta P-\overline{\Delta P})$. This signal drives the thermometer bridge so that the output is an analog of $\Delta T(\Delta P-\overline{\Delta P})$ where ΔT is the bridge temperature unbalance. If the bridge is set at a null temperature very different from the air temperature so that a large unbalanced offset appears in ΔT, the peak-to-peak range of the fluctuating bridge output is unduly large and may saturate the following electronics. To facilitate balancing the bridge, it can be switched from the high-pass filter to a battery. The output of the bridge is fed to a differential amplifier and thence to either an electronic integrator or a recorder with ball-and-disc integrator. The integrator is preceeded by a 5-sec low-pass filter to decrease the transient response and dynamic range requirements.

3. Theory of operation

The pressure distribution at points on a sphere in a perfect fluid with irrotational motion is given by Lamb (1932; sec. 92) as

$$P = P_s + (\rho/2)V^2[1 - (9/4)\sin^2\psi] \qquad (1)$$

where P_s is the static pressure, ρ is the density of air, V is the air speed, and ψ is the angle between $\vec{V}$ and the radius vector of the point. Schlichting (1960, p. 20) shows that in real fluids, the pressure distribution is that of ideal fluids for $\psi \lesssim 65^\circ$. If the yaw sphere is directed azimuthly into the wind, then the pressure difference between the ports of the yaw sphere is

$$\Delta P = P_2 - P_1 = (9\rho/8)|\vec{V}|^2(\sin^2\psi_1 - \sin^2\psi_2)$$

This holds for winds within a vertical angle $\alpha = \pm(65^{\circ}-\frac{1}{2}\theta)$ where α is the angle between the wind vector and the bisect of the ports and θ is the included angle between the ports. Assuming that the vane directs the sphere into the wind, the components of the wind vector with respect to the x,z plane formed by the ports and the stem are

$$u = |V| \cos\alpha \tag{2a}$$

$$v = 0 \tag{2b}$$

$$w = |V| \sin\alpha \tag{2c}$$

Since $\psi_1 = (\alpha + \frac{1}{2}\theta)$ and $\psi_2 = (\alpha - \frac{1}{2}\theta)$

$$\Delta P = (9/4)(\sin\theta)\, \rho uw \tag{3}$$

The electrical output of the pressure transducer is

$$E_p = M(\Delta P) = bM\rho uw$$

where $b = (9/4 \sin\theta)$ and M is the transducer constant. The output of the high pass filter is

$$E_F = E_p - \overline{E_p} = M(\Delta P - \overline{\Delta P}) \tag{4a}$$

Substituting (3) into (4a), and using Reynold's notation

$$E_F = b\, M\, \rho(\bar{u}w' + \bar{w}u' + u'w' - \overline{u'w'}) \tag{4b}$$

Since $\Delta T = \overline{\Delta T} + \Delta T' = \overline{\Delta T} + T'$, where $\overline{\Delta T}$ is the mean bridge balance offset, the output of the bridge is

$$E_B = BE_F\,\Delta T = BE_F(\overline{\Delta T} + T') \qquad (5)$$

where B is the bridge constant. The amplifier output is then

$$E_0 = G\,E_B \qquad (6)$$

where G is the amplifier gain. When E_0 is integrated we have from (4), (5), and (6),

$$\overline{E_0} = bGBM\rho(\bar{u}\,\overline{w'T'} + \bar{w}\,\overline{u'T'} + \overline{u'w'T'}) \qquad (7)$$

Assuming the last two terms in parentheses in (7) are negligible as compared with the first, the product of the sensible heat flux and the mean wind is

$$\begin{aligned}\bar{u}H &\approx \rho c_p(\bar{u}\,\overline{w'T'} + \bar{w}\,\overline{u'T'} + \overline{u'w'T'}) \\ &= c_p\,\overline{E_0}/bGBM\end{aligned} \qquad (8)$$

If a cup anemometer is run near the yaw sphere-thermometer assembly at the same height to find $\bar{u}$,

$$H \approx c_p[(9/4)GBM\,\sin\theta]^{-1}(\overline{E_0}/\bar{u}) \qquad (9)$$

4. Measurements

Sensible heat flux density measurements were made with the yaw sphere and thermometer during three days in September 1968 at Hancock, Wisconsin. The yaw sphere was about 95 cm above a crop of snap beans. We integrated E_0 with a ball-and-disc on a strip chart recorder which also

gave a record of E_0. We used (9) to find the heat flux where $\theta = 45^o$ for our sphere. The mean wind speed was measured with a cup anemometer mounted at about the same height and located 15 m from the yaw sphere. We compared the results with eddy correlation measurements of sensible heat flux density made with a three-dimensional pressure-sphere anemometer in combination with a fast thermometer. We also compared the results with energy balance measurements, where the sensible heat flux density was found by subtracting measured soil heat flux density and evaporation from the net radiation. Wesely, et al. (1969b) describe the site, the pressure sphere anemometer and thermometer measurements and the energy balance measurements.

All measurements are given in Fig. 2 for three periods. The fluctuation of the energy balance measurements is mainly due to the lysimeter, which is not well suited to measuring evaporation over periods as short as 30 min when peak evaporation is equivalent to 250 w/m^2. Also any phase differences in the three heat flux terms can make for large relative errors in sensible heat; this is particularly evident around 1800 hours.

The yaw sphere-thermometer results generally are higher than the other two measurements. The difference between yaw sphere-thermometer data and that of the other methods corresponds more nearly to a zero offset than to a proportionality factor. A damaging zero offset could easily arise since the mean bridge output voltage was of the order of 80 to 120 μv during periods of high sensible heat flux. In the equipment, which we jerry-rigged hurriedly for this test, there were two possible sources of zero error: no particular precaution was taken to avoid thermal emf's in the bridge; also in the

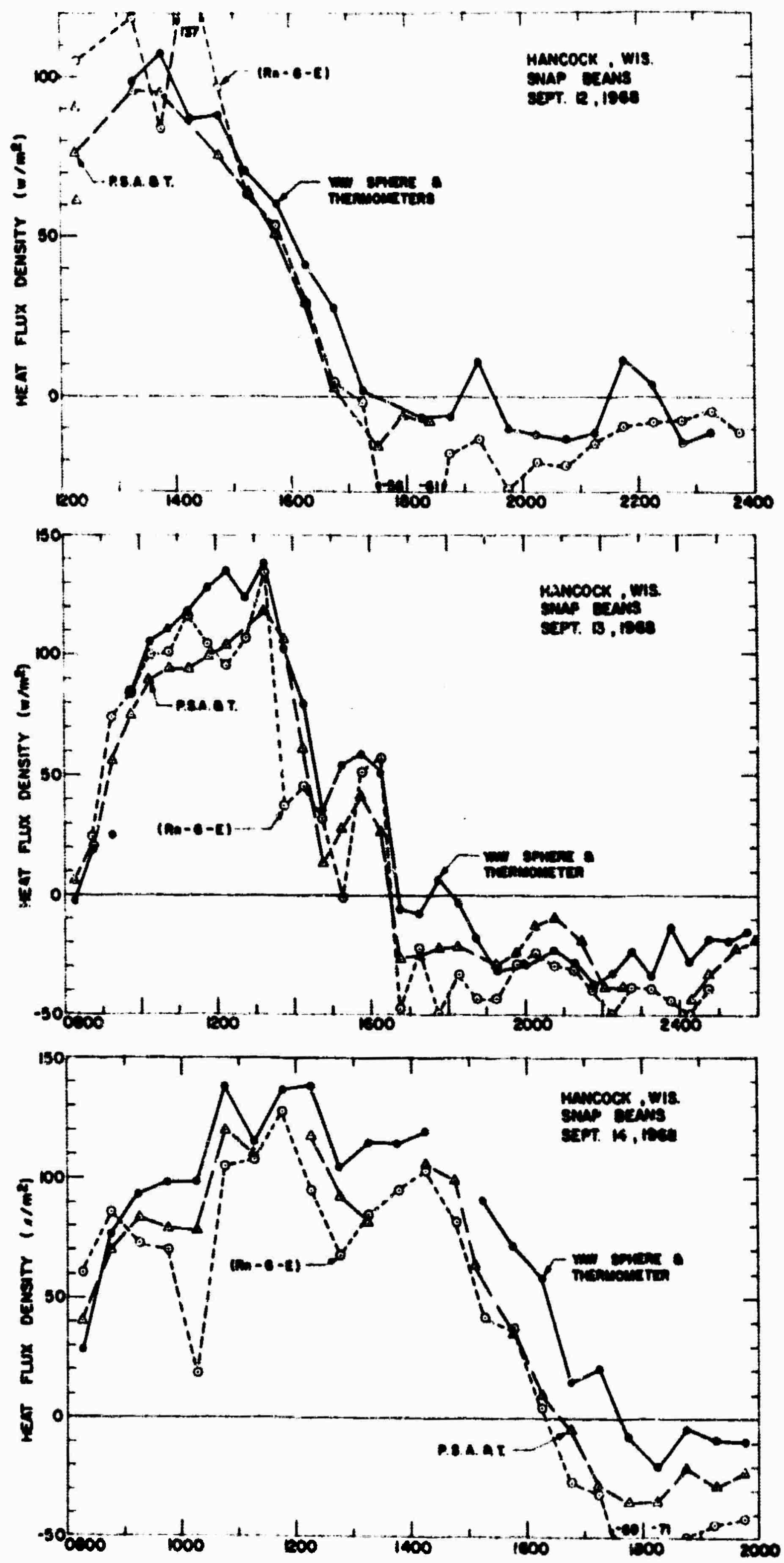

Fig. 2. Sensible heat flux density from the yaw sphere and thermometer system, energy balance measurements, and from the three-dimensional pressure sphere anemometer and thermometer system.

constructing of the active, high-pass filter, no special attention was given to avoiding small d-c components in the output, and any d-c across the unbalanced thermometer bridge would result in a zero offset. These features of the system can be improved relatively easily.

In view of the success of the preliminary tests of this simple yaw sphere-thermometer system, we believe it holds high promise for routine measurements of sensible heat flux density as close to the ground as one-meter where other eddy correlation systems are not suitable.

REFERENCES

Lamb, H., 1932: Hydrodynamics. Dover, N. Y. 738 p.

Schlichting, H., 1960: Boundary layer theory. McGraw-Hill, N. Y. 647 p.

Thurtell, G. W., C. B. Tanner, and M. L. Wesely, 1969: Three-dimensional pressure-sphere anemometer system. J. Appl. Meteor., 8 (submitted).

Wesely, M. L., G. W. Thurtell, and C. B. Tanner, 1969a: A fast-response thermometer for eddy correlation measurements. J. Appl. Meteor., 8 (submitted).

Wesely, M. L., G. W. Thurtell, and C. B. Tanner, 1969b: Eddy correlation measurement of sensible heat flux near the earth's surface. J. Appl. Meteor., 8 (submitted).

ANEMOCLINOMETER EQUATIONS AND COMPUTER PROGRAM

The instrument, shown in Figures 1 and 2, consists of a spherical head, 3 cm in diameter, mounted on a supporting shaft. When in use the probe is fixed in the fluid, with the shaft axis parallel to the direction of mean flow and the sphere on the upstream end of the shaft. In the following discussion, all coordinate axes, planes, and the velocities are referenced to the ports in the anemoclinometer head and the anemoclinometer axis.

The static pressures developed between small holes drilled in the spherical probe head are measured (Figure 2). The pressure difference between the two holes in the x-z plane is measured and also between the two holes in the x-y plane; each of these four holes is drilled at a 45° angle to the axis of the shaft. In addition to the above pressure ports an upstream opening in the spherical head leads into a Venturi centered on the axis of the shaft. A small pressure tube is placed in this Venturi, parallel to the probe shaft, with its open end in the upstream direction. The pressure difference is measured between the pitot and eight reference ports on the surface of the spherical head, which are located on a circle at an angle of 47.5° to the shaft axis.

The instantaneous velocity component along the z-axis and normal to the shaft in the x-z plane of the two vertical ports (plane Z, Figure 2) is defined as w. The velocity components in the x-y plane of the two horizontal ports (plane Y, Figure 2), are u and v, with u as the component parallel with the shaft (x-coordinate) and v as the component normal to the shaft in the x-y plane (y component). The equations for the velocity vectors with respect to the anemoclinometer coordinates are

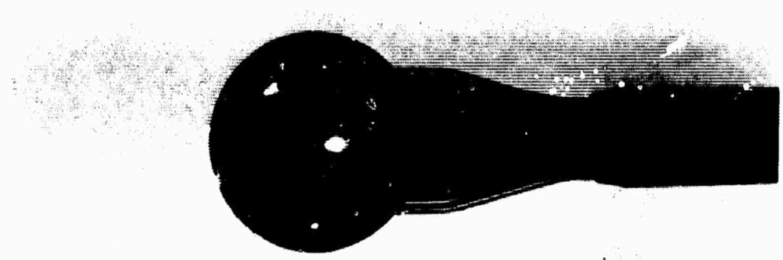

Fig. P1. Spherical sensing head of anemoclinometer showing pressure ports.

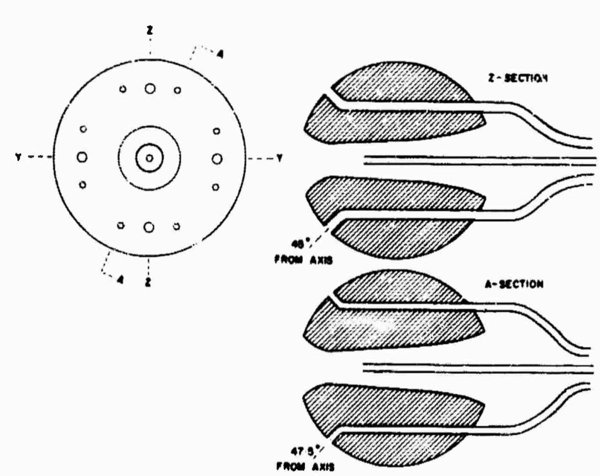

Fig. P2. Front and cross-section views of anemoclinometer head, y- and z-coordinates shown on front view.

$$u = |\vec{V}| \cos F' \ \cos G \approx |\vec{V}| \cos F' \ \cos G' \qquad [1a]$$

$$v = |\vec{V}| \cos F' \ \sin G = |\vec{V}| \sin G' \qquad [2a]$$

$$w = |\vec{V}| \sin F' \qquad [3a]$$

$$|\vec{V}| = (u^2 + v^2 + w^2)^{\frac{1}{2}} \qquad [4a]$$

where F, and G are the elevation and azimuth angles projected on the x,z and x,y planes and F′ and G′ are complements of the directional angles as shown in Figure 3. We can find

$$F' = \arctan [\tan(F \cos G)] \approx F \cos G \qquad [5a]$$

The approximations in [1a] and [5a] result in less than 5% error at angles equal to or less than 30°.

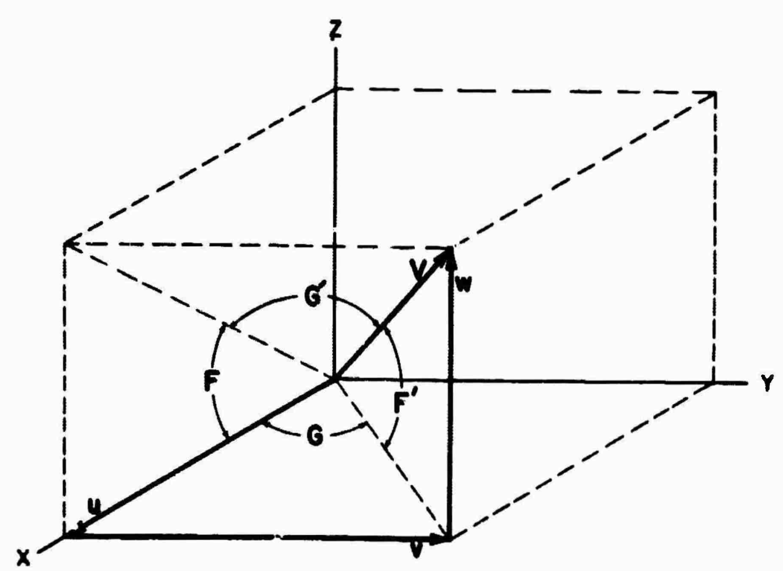

Fig. P3. Definition of the components u, v, and w of the total wind vector $\vec{V}$; the elevation and azimuth angles, F′ and G′, which are complements of the directional angles; and F and G, which are the projections of F′ and G′ on the x,z and x,y planes respectively.

Anemoclinometer Constants (30-mm Sphere)

The pressure P_V, measured between the pitot and the reference ports is related to the true dynamic pressure, P_O, as

$$P_V/P_O = a \qquad [6a]$$

where $P_O = (\rho/2)\vec{V}^2$ and where the first anemoclinometer constant, a, is close to 1.015 for the 3-cm anemoclinometer.

When the centerline of the uw ports (anemoclinometer axis) is at an angle, F, with respect to the mean flow (G = 0 in Figure 3) a pressure, P_F, is developed between the ports, where

$$P_F = b\rho uw \qquad [7a]$$

where b is approximately constant, and is near 1.70 for the 3-cm anemoclinometer when 2000 < Re < 200,000.

The ratio of P_F/P_V changes linearly with angle ($F \leq 20^\circ$) as shown in Figure 4.

$$(P_F/P_V)/F = c = 0.057/\text{deg} = 3.266/\text{rad} \qquad [8a]$$

where c is the third probe constant.

Note that equations analogous to [7a], and [8a], exist for the uv ports upon rotation through an azimuth angle, $G \leq 20^\circ$, when F = 0

$$P_G = b\rho uv \qquad [9a]$$

$$(P_G/P_V)/G = c = 0.057/\text{deg} = 3.266/\text{rad} \qquad [10a]$$

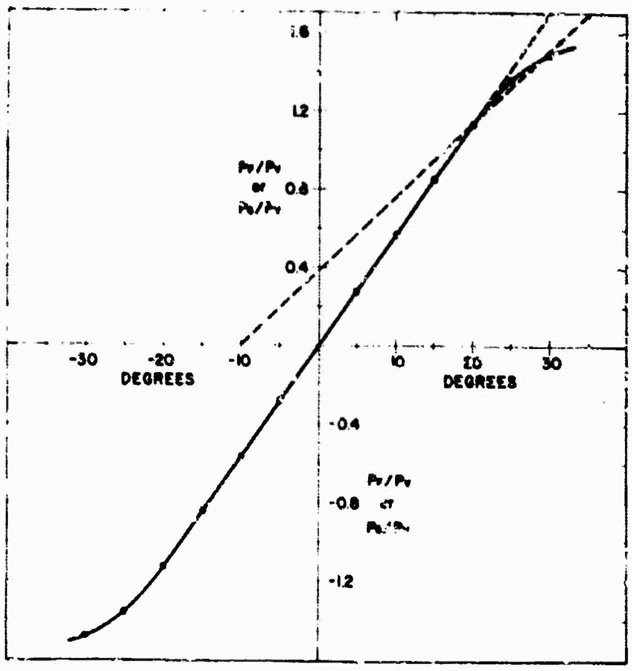

Fig. P4. Variation of (P_F/P_V) as angle F is changed with angle G = 0, or of P_G/P_V as angle G is changed with F = C.

The above F, G angle relations hold for the linear region of Figure 4 until the velocity vector is 20° off axis. Beyond 20°, the relation is approximated by

$$F = c_1'(P_F/P_V) - c_2' \qquad [11a]$$

which can also be written as

$$F_2 = c_1 F_1 - c_2 \qquad [12a]$$

where $F_1 = (P_F/P_V)/c$. Similarly,

$$G_2 = c_1 G_1 - c_2 \qquad [13a]$$

where $G_1 = (P_G/P_V)/c$. In [12a] and [13a], c_1 and c_2 have values of $c_1 = 1.500$ and $c_2 = 10$ degrees = 0.1745 rad. Equations [12a, 13a] are shown by the dashed line in Figure 4. Other approximations can be used, but since accuracy at F_2 or G_2 greater than 30° is poor, there is little basis for choice.

Wind Component Calculations

To find u, v, w using [1a, 2a, 3a], we find V from [6a] and find F′ and G′ from calibration curves provided by the Institute de Mecanique des Fluides de Lille (IMFL) for their anemoclinometers (Figure 5). These curves give the variation of (P_F/P_V) and (P_G/P_V) for winds which are outside of the x, z and the x, y planes. IMFL does not specify whether the symmetric angles in Figure 5 are the angles F and G projected on the x,z and x,y planes or if they are F′ and G′, which are complements of the directional angles (see Fig. 3). We have assumed that F′ and G′ were the appropriate angles[1/].

[1/] If F and G were the correct angles then [5a] would be used to determine the angles F′ for use in [1a, 2a, and 3a]. We believe the choice of F′ and G′ is correct because if we had used F and G, the values of w and v at F = G = 30° would have been about 10% smaller than if F′ and G′ had been used and 5% smaller at F = G = 20°. Our calculations of shear stress which used F′ and G′, never appear systematically large as would be the case if F were the correct angle.

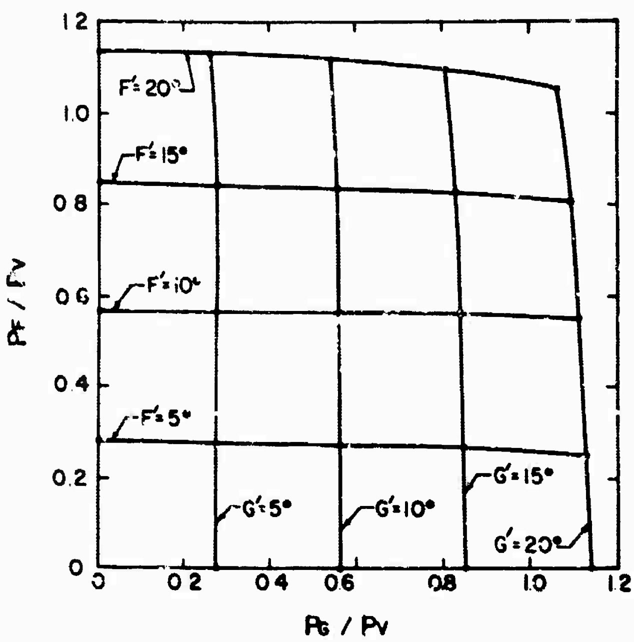

Fig. P5. Variation of (P_F/P_V) and (P_G/P_V) as both F and G vary.

The experimental data for anemoclinometers shown in Figure 5 indicates that the (P_F/P_V) at any angle G′ is related to that for G′ = 0 as

$$(P_F/P_V)_{G'} = \cos G' \, (P_F/P_V)_{G'=0}$$

Similarly,

$$(P_G/P_V)_{F'} = \cos F' \, (P_G/P_V)_{F'=0}$$

using [8a] and [10a] we have

$$F' = (P_F/P_V)/c \cos G' \qquad [14a]$$

$$G' = (P_G/P_V)/c \cos F' \qquad [15a]$$

We find F' and G' by iteration:

Step 1: An angle F'_1 is found from [8a].

Step 2: An F'_2 is found from [12a] if $F'_1 > 20^\circ$; if $F'_1 \leq 20^\circ$, $F'_2 = F'_1$

Step 3: Using $\cos F'_2$, G'_1 is found from [15a].

Step 4: A G'_2 is found from [13a] if $G'_1 > 20^\circ$; if $G'_1 \leq 20^\circ$, then $G'_2 = G'_1$.

Step 5: Using $\cos G'_2$, F'_3 is found from [14a].

Step 6: An F'_4 is found from [12a] if $F'_3 > 20^\circ$; if $F'_3 < 20^\circ$, $F'_4 = F'_3$.

Although further iterations could be made, F'_4 and G'_2 are within 1% of the values obtained by a third loop.

Azimuth angle measurement:

During 1968, the anemoclinometers were mounted on masts which were servo-driven with slow motors to maintain orientation into the wind with a dead-band of about 10°. The uv signal from the anemoclinometers was used for sensing direction. The rotation of the masts was measured with a potentiometer. The azimuth angle used in the wind calculations was, G_4, defined as

$$G_4 = G'_2 + (G_3 - G_{4P}) \qquad [16a]$$

where G_3 was the angle of mast rotation measured by the servo potentiometer, G_{4P} was the mean G_4 for the previous

half-hour, and G_2' is the azimuth angle with respect to the anemoclinometer as found by [15a] in the iteration procedure.

PROGRAM

Program Constants

Thermometers:

B_1, B_2 constants for tungsten wire air temperature thermometer and bridge where $T = B_1 + B_2V_4$, Celsius

B_3, B_4 constants for thermistor and the linearized bridge for measuring the surface temperature of the B_aF_2 humidity sensor. $T_H = B_3 + B_4V_6$.

Heat:

$C_T = \rho c_p = 2.9$ cal cm^{-3}K^{-1}, heat capacity of air

Vapor pressure:

$C_0 = 6.108$mb = saturation vapor pressure at zero Celsius

$C_1 = 7.5$, $C_2 = 237.3$ Celsius: constants in Teten's formula for calculating saturation vapor pressure, S, corresponding to a Celsius temperature, T.

S (defined here and on P14)

$$S/C_0 = 10^{[C_1T/(C_2 + T)]} = \text{antilog}_{10}[C_1T/(C_2 + T)]$$

C_V = slope of the B_aF_2 humidity sensor calibration curve for operating range [(Δrelative humidity)/Δvolts)

C_R = 4620mb cm^{-3}K^{-1}gm^{-1}, the specific gas constant for water vapor.

Wind and stress:

$E_1 = 1.015$ = a in [6a]

$E_2 = 3.266$rad^{-1} = c in [8a, 10a]

$E_3 = 1.5 = C_1$ in [12a, 13a]

$E_4 = 0.1745$rad $= C_2$ in [12a, 13a]

$\left.\begin{array}{l}E_5\\E_6\end{array}\right\}$ Potentiometer constants to give (see [16a])

$$G_3 = E_5V_7 + E_6 \qquad [17a]$$

M = range constant of pressure transducer which converts output to pressure

R = 1.2gm cm^{-3} = density of air

Channels

Channel	Signal	Sensor	Variable
1	V_1	Pressure transducer #1	$P_V = (a_0/2)V^2$
2	V_2	" " #2	$P_F = b_0uw$
3	V_3	" " #3	$P_G = b_0uv$
4	V_4	Resistance wire thermometer for air temperature	T
5	V_5	Barium fluoride humidity sensor	H = relative humidity
6	V_6	Barium fluoride sensor temperature from a thermistor	T_H
7	V_7	Probe angle from potentiometer (see [16a, 17a]	G_3

Initialization Program

The electronics of the pressure sensors have an electrical zero, V_0, and a full-scale, V_F, voltage readout for any pressure range. The measured voltages must be normalized to $(V_F - F_0)$. In addition. a wind-tight chamber is placed over the anemoclinometer sphere to shut out the wind and short all the ports hydraulically; any residual signal, V_S on any pressure range are due to sensor offset and this must be accounted for. Thus we have a normalized voltage from any transducer

$$V_n = (V - V_S)/(V_F - V_O) \qquad [18a]$$

During the initialization program, the V_O, V_F, V_S are read on each channel for 1 to 3 minutes, averaged, and stored as constants in the machine so that the normalized voltages may be calculated.

Combined Constants Used in Program

$D_1 = M_1/(V_{F1} - V_{01})$: M_1 is the range constant of pressure transducer #1 to convert $V_{n1} = (V_1 - V_{S1})/(V_{F1} - V_{01})$ to P_V (see [22a])

$D_2 = M_2/(V_{F2} - V_{02})$: Similar to D_1 but for P_F

$D_3 = M_3/(V_{F3} - V_{03})$: Similar to D_1 but for P_G

$A_1 = D_2/D_1E_2$

Note that $(D_2/D_1E_2)[(V_2 - V_{S2})/(V_1 - V_{S1})] = (P_F/P_V)/E_2 = F_1$

$A_2 = D_3/D_1E_2$ which, analogous to A_1, is used to find G from $(V_3 - V_{S2})/(V_1 - V_{S1})$.

$A_3 = (RE_1/2)/D_1$

Note that $(V_1 - V_{S1})/A_3 = V^2 = u^2 + v^2 + w^2$

ON-LINE COMPUTATIONS

$$V_1 - V_{S1} = X_1 \qquad [1A]$$

If X_1 is negative, set to zero and record the number of times X_1 was negative

$$V_2 - V_{S2} = X_2 \qquad [1B]$$

$$V_3 - V_{S3} = X_3 \quad [1C]$$

$$F_1 = A_1(X_2/X_1) \quad [2]$$ 2/

If $|F_1| > 0.349$rad (20°), then

$$|F_2| = E_3|F_1| - E_4 \quad [3A]$$

If $|F_1| \leq 0.349$rad then

$$|F_2| = |F_1| \quad [3B]$$

Sign of F_2 is the same as the sign of F_1

$$G_1 = A_2(X_3/X_1) \quad [4]$$

If $|G_1| > 0.349$rad, then

$$|G_2| = E_3|G_1| - E_4 \quad [5A]$$

If $|G_1| \leq 0.349$rad, then

$$|G_2| = |G_1| \quad [5B]$$

Sign of G_2 is the same as the sign of G_1.

If G_2 exceeds 0.69rad (40°) set $G_2 = 0.69$rad and record number of times $G_2 > 0.69$rad.

$$F_3 = A_1(X_2/X_1) \quad [6]$$

If $|F_3| > 0.349$rad,

$$|F_4| = E_3|F_3| - E_4 \quad [7A]$$

2/ Eqs. [2] through [7] are from equations on page P8.

If $|F_3| < 0.349$rad

$$|F_4| = |F_3| \qquad [7B]$$

Sign of F_4 is the same as the sign of F_3. If F_4 exceeds 0.69rad, set $F_4 = 0.69$rad and record number of times $F_4 > 0.69$ rad.

$$G_3 = E_5V_7 + E_6 \qquad [8A]$$

$$G_4 = G_2 + (G_3 - \bar{G}_{4P}) \qquad [8B]$$

where $\bar{G}_{4P} = \bar{G}_2 + \bar{G}_3$ for the previous run ($\bar{G}_2$ = mean G_2, $\bar{G}_3$ = mean G_3).

$$X_1^{\frac{1}{2}} \sin F_4 = A_2^{\frac{1}{2}} w \qquad [9A]$$ 3/

$$X_1^{\frac{1}{2}} \cos F_4 \cos G_4 = A_3^{\frac{1}{2}} u \qquad [9B]$$

$$X_1^{\frac{1}{2}} \sin G_4 = A_3^{\frac{1}{2}} v \qquad [9C]$$

$$T_H = B_3 + B_4V_6 \qquad [10]$$

$$S/C_O = 10^{-[C_1T_H/(T_H + C_2)]} \qquad [11]$$ 4/

3/ NOTE: In the 1967 program, since the mast was not rotated through G_3, we used G_2 in place of G_4 in [9A, 9B, 9C].
See page P20 for alternate program equations

4/ NOTE: Teten's equation (continued 4/ page P14)

<u>Accumulate sums and calculate averages of:</u>

		<u>From</u>
N1	$= (1/n)\Sigma\ w\ A_3^{\frac{1}{2}}$	[9A]
N2	$= (1/n)\Sigma\ u\ A_3^{\frac{1}{2}}$	[9B]
N3	$= (1/n)\Sigma\ v\ A_3^{\frac{1}{2}}$	[9C]
N4	$= (1/n)\Sigma(w\ A_3^{\frac{1}{2}})^2$	[9A]
N5	$= (1/n)\Sigma(u\ A_3^{\frac{1}{2}})^2$	[9B]
N6	$= (1/n)\Sigma(v\ A_3^{\frac{1}{2}})^2$	[9C]
N7	$= (1/n)\Sigma(w\ A_3^{\frac{1}{2}})(u\ A_3^{\frac{1}{2}})$	[9A],[9B]
N8	$= (1/n)\Sigma(w\ A_3^{\frac{1}{2}})(v\ A_3^{\frac{1}{2}})$	[9A],[9C]
N9	$= (1/n)\Sigma(u\ A_3^{\frac{1}{2}})(v\ A_3^{\frac{1}{2}})$	[9B],[9C]
N10	$= (1/n)\Sigma[(u\ A_3^{\frac{1}{2}})^2 + (v\ A_3^{\frac{1}{2}})^2]^{\frac{1}{2}}$	N5,N6

4/ NOTE (Cont.). Teten's equation is also written

$$S/C_0 = \text{antilog}\ [C_1 T_H/(T_H + C_2)]$$

S is the saturation vapor pressure corresponding to the BaF_2 humidity sensor Celsius temperature, T_H. C_0 is the saturation vapor pressure at 0C, and C_1 and C_2 are constants, as given on page P9. [Tetens, O. 1930. Uber einige meteorologische Begriffe. Z. Geophys. 6:297-309.]

$N11 = (1/n)\Sigma(F_4)$	[7A],[7B]
$N12 = (1/n)\Sigma(F_4)^2$	[7A],[7B]
$N13 = (1/n)\Sigma(G_2)$	[5]
$N14 = (1/n)\Sigma(G_2)^2$	[5]
$N15 = (1/n)\Sigma(X_1)$	[1A]
$N16 = (1/n)\Sigma(X_2)$	[1B]
$N17 = (1/n)\Sigma(X_3)$	[1C]
$N20 = (1/n)\Sigma(V_4)$	Channel 4
$N21 = (1/n)\Sigma(V_4)^2$	Channel 4
$N22 = (1/n)\Sigma(V_4)(w\ A_3^{\frac{1}{2}})$	[9A],Channel 4
$N23 = (1/n)\Sigma(V_4)(u\ A_3^{\frac{1}{2}})$	[9B],Channel 4
$N24 = (1/n)\Sigma(V_4)(v\ A_3^{\frac{1}{2}})$	[9C],Channel 4
$N25 = (1/n)\Sigma(S)/(C_0)$	[11]
$N26 = (1/n)\Sigma[(S)/(C_0)]^2$	[11]
$N27 = (1/n)\Sigma(S/C_0)(w\ A_3^{\frac{1}{2}})(V_5)$	[11],[9A], Channel 5
$N28 = (1/n)\Sigma(S/C_0)(u\ A_3^{\frac{1}{2}})(V_5)$	[11],[9B], Channel 5
$N29 = (1/n)\Sigma(S/C_0)(v\ A_3^{\frac{1}{2}})(V_5)$	[11],[9C], Channel 5
$N30 = (1/n)\Sigma(V_6)$	Channel 6
$N31 = (1/n)\Sigma(V_6)^2$	Channel 6
$N32 = (1/n)\Sigma($[illegible]$_3)$	[3A]

$N33 = (1/n)\Sigma(G_3)^2$ [8A]

$N34 = (1/n)\Sigma(G_4)$ [8B]

$N35 = (1/n)\Sigma(G_4)^2$ [8B]

$N36 = (1/n)\Sigma(X_2)(V_4)$ [1B], Channel 4

$N37 = (1/n)\Sigma(w\ A_3^{1/2})(u\ A_3^{1/2})(V_4)$ [9A], [9B] Channel 4

$N38 = (1/n)\Sigma(V_5)$ Channel 5

$N39 = (1/n)\Sigma(V_5)^2$ Channel 5

$N40 = (1/n)\Sigma(S/C_0)(V_5)$ [11], Channel 5

$N41 = (1/n)\Sigma[(S/C_0)(V_5)]^2$ [11], Channel 5

Output Calculations (averages and standard deviations):

Parameter	Avg.	Stand. dev.
$F4 = F_4$	N11	$[(N12) - (N11)^2]^{1/2}$
$G2 = G_2$	N13	$[(N14) - (N13)^2]^{1/2}$
$G3 = G_3$	N32	$[(N33) - (N32)^2]^{1/2}$
$G4 = G_4$	N34	$[(N35) - (N34)^2]^{1/2}$
$U = u$	$(N2)/(A_3^{1/2})$	$\{(N5)/(A_3) - [(N2)/(A_3^{1/2})]^2\}^{1/2}$
$V = v$	$(N3)/(A_3^{1/2})$	$\{(N6)/(A_3) - [(N3)/(A_3^{1/2})]^2\}^{1/2}$
$W = w$	$(N1)/(A_3^{1/2})$	$\{(N4)/(A_3) - [(N1)/(A_3^{1/2})]^2\}^{1/2}$
$TA = T$	$(B_1) + (B_2)(N20)$	$\{(B_1)^2 + 2(B_1)(B_2)(N20) + (B_2)^2(N21) - [(B_1) + (B_2)(N20)]^2\}^{1/2}$

S	$(N25)(C_O)$	$\{(N26)(C_O)^2 - [(N25)(C_O)]^2\}^{1/2}$
Th = T_H	$(B_3) + (B_4)(N30)$	$\{(B_3)^2 + 2(B_3)(B_4)(N30) + (B_4)^2(N31) - [(B_3) + (B_4)(N30)]^2\}^{1/2}$
V_5	N38	$[(N39) - (N38)^2]^{1/2}$
E = e, mb	$[(N40) - (N25)(N38)](C_V)(C_O)$	$(C_V)[(N41) - (N40)^2]^{1/2}$ 5/

5/ <u>NOTE</u>: The relative humidity, H, is linear with the logarithm of the resistance. The electronics produces a voltage linear with H.

$$H_1 - H_2 = H' = -k\log R' = C_V V_5'$$

$$V_5 = \overline{V_5} + V_5'$$

$$S = \overline{S} + S' \qquad \text{as found from [11]}$$

$$\overline{SV_5} = \overline{S}\,\overline{V_5} + \overline{S'V_5'}$$

$$\overline{S'V_5'} = \overline{S\,V_5} - \overline{S}\,\overline{V_5}$$

$$C_V\,\overline{S'V_5'} = \overline{S'H'} = C_V(\overline{SV_5} - \overline{S}\,\overline{V_5})$$

Since the vapor pressure E = SH

$$\overline{E} = \overline{SH} = \overline{S}\,\overline{H} + \overline{S'H'}$$

$$\overline{E} = \overline{S}\,\overline{H} + C_O C_V[\overline{(S/C_O)V_5} - \overline{(S/C_O)}\,\overline{V_5}]$$

$$\overline{E} = \overline{S}\,\overline{H} + \{C_O C_V[(N40) - (N25)(N38)]\}$$

To find $\overline{E}$, $\overline{S}$ is found in the above output; $\overline{H}$ is found manually from $\overline{V}_5$ given in the output, using the calibration curve for the particular sensor; the term in braces is calculated above as an average.

$$(E')^2 = C_V[(N41) - (N40)^2]$$

Output Calculations (averages only):

Par.		Averages
X1 = X_1	N15	See NOTE 5/
X2 = X_2	N16	
X3 = X_3	N17	
RUW = $\overline{\rho u'w'}$	$[(R)/(A_3)][(N7) - (N2)(N1)]$	
RUV = $\overline{\rho u'v'}$	$[(R)/(A_3)][(N9) - (N2)(N3)]$	
RWV = $\overline{\rho w'v'}$	$[(R)/(A_3)][(N8) - (N1)(N3)]$	
W4 = $(u^2 + v^2)^{\frac{1}{2}}$	$(N10)/(A_3^{\frac{1}{2}})$	
HW = $\overline{C_T w'T'}$	$[(60.0)(B_2)(C_T)/(A_3^{\frac{1}{2}})][(N22) - (N20)(N1)]$	
HV = $\overline{C_T v'T'}$	$[(60.0)(B_2)(C_T)/(A_3^{\frac{1}{2}})][(N24) - (N20)(N3)]$	
HU = $\overline{C_T u'T'}$	$[(60.0)(B_2)(C_T)/(A_3^{\frac{1}{2}})][(N23) - (N20)(N2)]$	

EU = $\overline{\lambda q'w'}$

$$\text{RB1}\left\{\frac{(60.0)(C_O)[(N28) - (N40)(N2)]}{(C_R)[(B_1)+(B_2)(N20) + 273.2](A_3^{\frac{1}{2}})}\right\} \text{*(times)}$$

$$\{597.0 - 0.57\,[(B_1)+(B_2)(N20)]\}$$

EV = $\overline{\lambda q'v'}$

$$\text{RB1}\left\{\frac{(60.0)(C_O)[(N29) - (N40)(N3)]}{(C_R)[(B_1)+(B_2)(N20) + 273.2](A_3^{\frac{1}{2}})}\right\} \text{*(times)}$$

$$\{597.0 - 0.57\,[(B_1)+(B_2)(N20)]\}$$

EW = $\overline{\lambda q'w'}$

$$\text{RB1}\left\{\frac{(60.0)(C_O)[(N27) - (N40)(N1)]}{(C_R)[(B_1)+(B_2)(N20) + 273.2](A_3^{\frac{1}{2}})}\right\} \text{*(times)}$$

$$\{597.0 - 0.57\,[(B_1) + (B_2)(N20)]\}$$

5/ X_1, X_2, X_3 are used only in monitoring the input.

6/ See page P19.

J_1 $[(60)(B_2)][(N36)-(N16)(N20)]$ SEE NOTE 7/

J_2 $[(60)(B_2)(C_T)/(A_3)][(N37)-(N7)(N20)]$

6/ NOTE: The composition of the EU, EV, and EW terms are similar. EW = $\overline{\lambda q'w'}$ is the vertical vapor flux expressed as latent heat, where (60) is included to give cal $cm^{-2}min^{-1}$. In this equation

$\lambda = [597 - 0.57T]$, T in Celsius
to give cal/gm (latent heat)

$q = e/R_vT_K$, where T_K is Kelvin
and R_v is the specific gas
constant, so that

$q = e/[C_R(T + 273.2]$, T in Celsius

7/ NOTE: J_1 and J_2 calculate the heat flux term $(\rho c_p)[\bar{u}\ \overline{w'T'} + \bar{w}\ \overline{u'T'} + \overline{u'w'T'}]$ found by the yaw sphere and thermometer (Chapter 3). J_1 is based on values which are not corrected for pressure decreases with off-axis winds, whereas J_2 is corrected.

COORDINATE SYSTEMS AND ROTATIONS

In flow problems, the components of the flow velocity must be measured relative to some well-defined system of coordinates. In the atmosphere, unlike duct flow where the direction of mean flow is well defined, the coordinate system used can be selected arbitrarily. The wind velocity components are measured with respect to the instrument coordinates.

At the beginning of an experiment, the instrument may be roughly aligned with respect to the direction of mean flow; however, the direction of the mean flow is not known precisely until the end of the experiment. The instrument also can be referenced with respect to gravity and some arbitrary azimuthal direction.

Instrument Coordinate System

Let the x_1, y_1 plane be the plane of the two horizontal ports of the anemoclinometer, (plane Y in Figure P2), the x_1, z_1 plane be the plane of the two vertical ports of the anemoclinometer, (plane Z in Figure P2) and the y_1, z_1 plane be the plane perpendicular to both the x_1, y_1 plane and the x_1, z_1 plane. Since the relative positions of the ports are determined by precision machining, the x_1, y_1 plane is probably perpendicular to the x_1, z_1 plane to within a minute of arc, and we can assume the three planes are orthogonal.

The anemoclinometer is aligned in the field such that the x_1-axis is approximately the same direction as the mean wind vector, $\bar{\underset{\to}{V}}$; the y_1-axis is approximately normal to gravity (although it could be aligned roughly parallel to a sloping land or canopy surface), the z_1-axis is perpendicular to both x_1 and z_1 to form the third axis in a right-handed coordinate system. If the anemoclinometer is

moved in the x_1, y_1 plane during the measurement period to keep the angle between $\underset{\sim}{V}$ and x_1-axis within the acceptance angle of the anemoclinometer Venturi, we can redefine the reference of the x_1-axis, for example to be, true south, or we may also use as a reference the azimuth of the $\underset{\sim}{V}$ as determined during the previous measurement period. We elected the latter in the 1968 measurements.

General Coordinate Transforms

New coordinate systems can be defined by rotations of an angle η about the z_1-axis, the angle θ about the y_1-axis, or the angle β about the x_1-axis. The angle η is positive as the x,y plane is rotated counterclockwise as viewed from the z_1-axis; the angle θ is positive as the x,z plane is rotated clockwise as viewed from the positive y_1-axis; and the angle β is positive as the z,y plane is rotated counterclockwise as viewed from the positive x_1 axis.

The coordinate system rotations are orthogonal transformations and can be represented in matrix form (e.g. Albert, A. A. 1949. Solid analytic geometry. Phoenix Books Science Series, University of Chicago Press). For instance, if the x_1, y_1 plane is rotated about the z_1 axis by the angle η to define new axes, x_2, y_2, and z_2,

$$\begin{pmatrix} x_2 \\ y_2 \\ z_2 \end{pmatrix} = (Z_\eta) \begin{pmatrix} x_1 \\ y_1 \\ z_1 \end{pmatrix} \qquad [1A]$$

$$\text{where } (Z_\eta) = \begin{pmatrix} \cos\eta & \sin\eta & 0 \\ -\sin\eta & \cos\eta & 0 \\ 0 & 0 & 1 \end{pmatrix} \qquad [1B]$$

Similarly, rotations through the angles θ or β can be done with the orthogonal matrices, respectively.

$$(Y_\theta) = \begin{pmatrix} \cos\theta & 0 & \sin\theta \\ 0 & 1 & 0 \\ -\sin\theta & 0 & \cos\theta \end{pmatrix} \qquad [2]$$

and

$$(X_\beta) = \begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos\beta & \sin\beta \\ 0 & -\sin\beta & \cos\beta \end{pmatrix} \qquad [3]$$

If more than one rotation is performed, the second rotation angle is defined with respect to the coordinates after the first rotation. A third rotation angle would be defined with respect to the coordinates after the second rotation. Sequential rotations are indicated by placing the matrix of the succeeding transformation to the left of the matrix of the transformation that preceeded it.

Natural wind coordinate system:

A natural wind coordinate system may be defined as being a right-handed coordinate system in which the x-axis is parallel to the mean flow with x increasing in the direction of the flow; thus $\bar{w} = \bar{v} = 0$, where $\bar{w}$ and $\bar{v}$ are the mean wind components along the z-axis and the y-axis, respectively. The transformation from the instrument to the natural coordinate system, requires the rotation through angles η and θ. Rotation around the x-axis by an angle β will be considered later (p.R7), but for the present we shall assume that z-axis is normal to the land surface.

The instantaneous wind components can be separated into mean values and deviations from the means due to turbulence and can be represented in Reynold's notation as

$$u = \bar{u} + u' \qquad [4]$$

$$v = \bar{v} + v' \qquad [5]$$

$$w = \bar{w} + w' \qquad [6]$$

where $\bar{u}$, $\bar{v}$ and $\bar{w}$ are time averages and u', v' and w' are the deviations along the x-, y-, and z-axes, respectively. Since the mean wind components $\bar{w}_1$ and $\bar{v}_1$, as measured in the instrument coordinates, usually are not zero, we rotate through the angle η and then through the angle θ, where

$$\eta = \text{arc tan } (\bar{v}_1/\bar{u}_1) \qquad [7]$$

$$\theta = \text{arc tan} \left[\bar{w}_1/(\bar{u}_1^2 + \bar{v}_1^2)^{1/2}\right] \qquad [8]$$

$$\text{Let } (CE) = \cos\eta \equiv \bar{u}_1/(\bar{u}_1^2 + \bar{v}_1^2)^{1/2} \qquad [9]$$

$$(SE) = \sin\eta \equiv \bar{v}_1/(\bar{u}_1^2 + \bar{v}_1^2) \qquad [10]$$

$$(CT) = \cos\theta \equiv (\bar{u}_1^2 + \bar{v}_1^2)^{1/2}/(\bar{u}_1^2 + \bar{v}_1^2 + \bar{w}_1^2)^{1/2} \qquad [11]$$

$$(ST) = \sin\theta \equiv \bar{w}_1/(\bar{u}_1^2 + \bar{v}_1^2 + \bar{w}_1^2)^{1/2}$$

Then

$$\begin{pmatrix} u \\ v \\ w \end{pmatrix} = (Y_\theta)(Z_\eta) \begin{pmatrix} u_1 \\ v_1 \\ w_1 \end{pmatrix} \qquad [13]$$

Therefore,

$$u = u_1(CT)(CE) + v_1(CT)(SE) + w_1(ST) \qquad [14]$$

$$v = v_1(CE) - u_1(SE) \qquad [15]$$

$$w = w_1(CT) - u_1(ST)(CE) - v_1(ST)(SE) \qquad [16]$$

Equations [14], [15], and [16] can be written for the time-averaged wind components or for the fluctuating components.

$$\bar{u} = \bar{u}_1(CT)(CE) + \bar{v}_1(CT)(SE) + \bar{w}_1(ST) \qquad [17]$$

$$u' = u_1'(CT)(CE) + v_1'(CT)(SE) + w_1'(ST) \qquad [18]$$

$$v' = v_1'(CE) - u_1'(SE) \qquad [19]$$

$$w' = w_1'(CT) - u_1'(ST)(CE) - v_1'(ST)(SE) \qquad [20]$$

By the definition of θ and η, $\bar{v} = \bar{w} = 0$.

By performing the proper multiplications and averaging, [18], [19] and [20] can be manipulated to yield following relationships:

$$\begin{aligned}\overline{(u')^2} = {} & \overline{(u_1')^2}(CT)^2(CE)^2 + \overline{(v_1')^2}(CT)^2(SE)^2 + \overline{(w_1')^2}(ST)^2 \\ & + \overline{2u_1'v_1'}(CT)^2(CE)(SE) + \overline{2u_1'w_1'}(CT)(ST)(CE) \qquad [21] \\ & + \overline{2v_1'w_1'}(CT)(ST)(SE)\end{aligned}$$

$$\overline{(v')^2} = \overline{(v_1')^2}(CE)^2 + \overline{(u_1')^2}(SE)^2 - \overline{2u_1'v_1'}(CE)(SE) \qquad [22]$$

$$\begin{aligned}\overline{(w')^2} = {} & \overline{(w_1')^2}(CT)^2 + \overline{(u_1')^2}(ST)^2(CE)^2 + \overline{(v_1')^2}(ST)^2(SE)^2 \\ & - \overline{2u_1'w_1'}(CT)(ST)(CE) - \overline{2w_1'v_1'}(CT)(ST)(SE) \qquad [23] \\ & + \overline{2u_1'v_1'}(ST)^2(CE)(SE)\end{aligned}$$

$$\overline{u'w'} = \overline{u_1'w_1'}(CE)[(CT)^2 - (ST)^2] - 2\overline{u_1'v_1'}(CT)(ST)(CE)(SE)$$
$$+ \overline{w_1'v_1'}(SE)[(CT)^2 - (ST)^2] - \overline{(u_1')^2}(CT)(ST)(CE)^2 \quad [24]$$
$$- \overline{(v_1')^2}(CT)(ST)(SE)^2 + \overline{(w_1')^2}(CT)(ST)$$

$$\overline{u'v'} = \overline{u_1'v_1'}(CT)[(CE)^2 - (SE)^2] + \overline{w_1'v_1'}(ST)(CE)$$
$$- \overline{u_1'w_1'}(ST)(SE) - \overline{(u_1')^2}(CT)(CE)(SE) \quad [25]$$
$$+ \overline{(v_1')^2}(CT)(CE)(SE)$$

$$\overline{v'w'} = \overline{v_1'w_1'}(CT)(CE) - \overline{u_1'w_1'}(CT)(SE) - \overline{u_1'v_1'}(ST)[(CE)^2 - (SE)^2]$$
$$+ \overline{(u_1')^2}(ST)(CE)(SE) - \overline{(v_1')^2}(ST)(CE)(SE) \quad [26]$$

Similarly, a scalar such as temperature or water vapor measured near the anemoclinometer can be represented in Reynold's notation as $Q = \overline{Q} + Q'$ and covariances can be corrected by the transform to natural wind coordinates as follows:

$$\overline{Q'u'} = \overline{Q'u_1'}(CT)(CE) + \overline{Q'v_1'}(CT)(SE) + \overline{Q'w_1'}(ST) \quad [27]$$

$$\overline{Q'v'} = \overline{Q'v_1'}(CE) - \overline{Q'u_1'}(SE) \quad [28]$$

$$\overline{Q'w'} = \overline{Q'w_1'}(CT) - \overline{Q'u_1'}(ST)(SE) - \overline{Q'v_1'}(ST)(SE) \quad [29]$$

Natural coordinate system with an angular rotation about the x-axis.

At a site with adequate fetch, no divergence, and steady state flow, measurements indicate that in addition to $\bar{v} = \bar{w} = 0$, $\overline{(u')^2} > \overline{(w')^2}$ 1/. Lettau states that $\overline{u'v'} = \overline{w'v'} = 0$ 2/. Although wide variations of $\overline{(v')^2}$ at different meteorological sites with similar conditions have been reported, our measurements at a one-meter height indicate that $\overline{(u')^2} \geq \overline{(v')^2} > \overline{(w')^2}$.

When $\overline{u'v'} \neq 0$, conditions are not ideal; during the sampling period the horizontal wind velocity tends to increase as it shifts a particular direction 3/. When measurements indicate that $\overline{u'v'}$ is significantly different than zero, local divergence caused by fetch or surface homogeneity may be occurring, since the coordinate transform for forcing $\overline{u'v'}$ to zero results in finite $\bar{v}$ and $\bar{w}$. A shift in wind direction may be accompanied by a change in velocity due to flow about large-scale surface features; this large scale divergence also may affect $\overline{u'v'}$ significantly over our 30-min sampling period.

Since $\bar{v} = 0$ and there is no reason to expect v' to be correlated with w' 4/, measurements

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1/ Lumley, J. L. and H. A. Panofsky. 1964. The structure of atmospheric turbulence. Interscience Monogr. Vol. 12. John Wiley and Sons, New York, 239 p.

2/ Lettau, H. H., 1968. Three-dimensional turbulence in unidirectional mean flow. p.127-156. In Studies of the effects of boundary modification in problems of small area meteorology. U. S. Army Electronics Command Tech. Rept. ECOM66-624-A, 156p.

3/ Sutton, O. G. 1953. Micrometeorology. McGraw-Hill Book Company, Inc. 333p.

4/ Sutton, O. G. 1948. Atmospheric turbulence. Methuen & Co. Ltd. London. 107 pp.

of finite $\overline{w'v'}$ indicate that the z-axis is orientated such that part of $\overline{u'w'}$ appears in $\overline{w'v'}$. By a proper rotation of the z,y plane through the angle β in the natural wind coordinate system, $\overline{w'v'}$ can be set to zero, with $\bar{v}$ and $\bar{w}$ remaining zero. The result is that the x,y plane is made parallel to the average slope of the terrain somewhere upwind from the sampling point.

Using (X_β) from [3] and letting u_2, v_2 and w_2 be the wind components after the planar rotation to make $\overline{w_2'v_2'} = 0$,

$$\begin{pmatrix} u_2 \\ v_2 \\ w_2 \end{pmatrix} = (X_\beta) \begin{pmatrix} u \\ v \\ w \end{pmatrix} \qquad [30]$$

Therefore,

$$u_2 = u \qquad [31]$$

$$v_2 = v(CB) + w(SB) \qquad [32]$$

$$w_2 = w(CB) - v(SB) \qquad [33]$$

where

$$CB = \cos\beta \qquad [34]$$

$$SB = \sin\beta \qquad [35]$$

The proper multiplications and averaging of the deviation of the wind components results in

$$\overline{(v_2')^2} = \overline{(v')^2}(CB)^2 + 2\overline{v'w'}(CB)(SB) + \overline{(w')^2}(SB)^2 \qquad [36]$$

$$\overline{(w_2')^2} = \overline{(w')^2}(CB)^2 - 2\overline{w'v'}(CB)(SB) + \overline{(v')^2}(SB)^2 \qquad [37]$$

$$\overline{u_2'w_2'} = \overline{u'w'}(CB) - \overline{u'v'}(SB) \qquad [38]$$

$$\overline{u_2'v_2'} = \overline{u'v'}(CB) + \overline{u'w'}(SB) \qquad [39]$$

$$\overline{w_2'v_2'} = \overline{v'w'}[(CB)^2 - (SB)^2] + \overline{(w')^2}(CB)(SB) - \overline{(v')^2}(CB)(SB) \qquad [40]$$

and

$$\overline{(u_2')^2} = \overline{(u')^2} \qquad [41]$$

$$\overline{u_2} = \bar{u} \qquad [42]$$

$$\bar{v} = \bar{w} = 0 \qquad [43]$$

For a scalar quantity Q,

$$\overline{Q'u_2'} = \overline{Q'u'} \qquad [44]$$

$$\overline{Q'v_2'} = \overline{Q'v'}(CB) + \overline{Q'w'}(SB) \qquad [45]$$

$$\overline{Q'w_2'} = \overline{Q'w'}(CB) - \overline{Q'v'}(SB) \qquad [46]$$

To make $\overline{w_2'v_2'} = 0$, we must manipulate [40] to get

$$(SB) = \{-(CB) + [(CB)^2 + 8(K)^2]^{1/2}\}/4(K) \qquad [47]$$

where

$$K = \overline{w'v'}/[\overline{(v')^2} - \overline{(w')^2}] \qquad [48]$$

The positive sign must be used in [47] because then $\overline{(w_2')^2}$ is minimized and $\overline{(v_2')^2}$ is maximized, as is desirable for $\overline{(v_2')^2} > \overline{(w_2')^2}$. Since θ = arc cos (CB) is small, (CB) and (SB) can be found in a few iterations by first assuming CB $\approx$ 1, then solving [47] for SB, then

$$CB = (K)/(SB) - 2(K)(SB) \qquad [49]$$

and repeating until sufficient convergence obtains.

DATA LISTING

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND	F ELEV	FSD ANGLE	G AZIM	GSD ANGLE	WIND DIR	WIND SHIFT
		....	WIND ST DEV CM/SEC	....		......	REYNOLDS STRESSES DYNES/CM2	....	CM/SEC	RAD	RAD	RAD	RAD	RAD	RAD
42267															
923	1	199.81	66.72	52.67	24.03	-.375	.038	.056	206.22	.000	.135	-.255	.257	0.000	0.000
923	2	200.51	66.20	51.59	23.60	-.411	-.080	-.098	206.32	.034	.133	-.231	.251	0.000	0.000
923	3	203.50	64.57	51.29	23.41	-.369	.071	.116	207.41	-.004	.131	-.261	.246	0.000	0.000
953	1	230.16	67.17	65.02	25.95	-.399	.192	.067	238.70	.005	.121	-.174	.271	0.000	0.000
953	2	230.36	68.18	63.75	26.12	-.552	.064	-.144	238.14	.043	.121	-.173	.260	0.000	0.000
953	3	233.85	65.75	63.41	25.94	-.398	.317	.169	240.00	-.002	.118	-.181	.262	0.000	0.000
1108	1	315.74	95.33	69.25	33.56	-1.156	-1.125	.069	322.72	.004	.118	-.335	.208	0.000	0.000
1108	2	324.42	92.70	64.66	32.44	-1.010	-1.224	-.083	329.95	.049	.107	-.328	.187	0.000	0.000
1108	3	328.14	88.09	64.39	32.97	-.950	-.411	.213	330.27	-.015	.109	-.321	.190	0.000	0.000
1158	1	343.28	88.82	93.64	37.38	-.992	.146	.179	355.46	.007	.113	-.009	.266	0.000	0.000
1158	2	342.61	89.76	94.16	38.62	-1.143	.127	-.450	354.85	-.012	.118	.010	.270	0.000	0.000
1158	3	349.24	89.80	92.89	38.61	-1.134	.776	.447	359.30	.021	.116	0.000	.264	0.000	0.000
1230	1	365.86	98.39	108.18	39.92	-1.390	-.535	.249	360.97	.012	.115	-.025	.284	0.000	0.000
1230	2	365.11	94.48	109.42	41.29	-1.254	-.807	-.677	380.53	-.003	.117	-.006	.289	0.000	0.000
1230	3	373.01	92.47	106.81	41.48	-1.317	-1.006	.759	385.04	.022	.114	-.027	.278	0.000	0.000
1300	1	352.34	97.35	85.48	37.11	-1.135	-1.369	.226	362.79	.005	.111	-.102	.250	0.000	0.000
1300	2	351.49	98.43	86.36	37.16	-1.070	-1.306	-.451	362.53	-.007	.113	-.084	.253	0.000	0.000
1300	3	355.25	98.16	85.09	38.91	-1.236	-1.457	.539	363.60	.016	.115	-.093	.249	0.000	0.000
1411	1	382.65	89.78	84.40	39.01	-1.251	-.442	.408	391.16	.063	.105	-.246	.221	0.000	0.000
1411	2	379.42	88.74	83.91	40.00	-1.293	-.623	-.332	388.31	.006	.110	-.246	.219	0.000	0.000
1411	3	384.92	92.41	80.86	39.45	-1.342	-.156	.254	389.39	-.056	.110	-.231	.212	0.000	0.000
1441	1	350.86	84.51	66.50	36.49	-1.098	-.291	.338	356.52	.065	.110	-.281	.192	0.000	0.000
1441	2	349.29	82.86	65.35	37.03	-1.052	-.205	-.222	355.16	.005	.110	-.280	.188	0.000	0.000
1441	3	354.57	82.60	65.23	36.73	-1.039	-.033	.108	356.75	-.062	.109	-.261	.187	0.000	0.000
1515	1	347.05	79.51	60.44	36.37	-1.047	-.546	.254	351.62	.067	.110	-.248	.176	0.000	0.000
1515	2	344.56	77.77	60.05	36.48	-.970	-.425	-.161	349.57	.005	.110	-.252	.174	0.000	0.000
1515	3	347.03	78.87	58.95	36.60	-1.151	-.414	.157	348.85	0.000	0.000	-.240	.173	0.000	0.000
1611	1	326.07	82.82	63.88	34.24	-1.053	1.194	.040	331.49	.070	.112	-.223	.195	0.000	0.000
1611	2	323.11	79.95	63.47	34.74	-1.032	.555	-.197	328.97	.002	.113	-.134	.192	0.000	0.000
1611	3	325.62	80.40	62.47	34.88	-1.029	.255	.139	328.93	-.056	.113	-.176	.190	0.000	0.000
1640	1	373.39	99.70	23.67	32.47	-1.055	.437	-.116	373.74	-.037	.096	-.544	.079	0.000	0.000
1640	2	393.35	103.37	23.18	31.55	-1.097	-.494	.100	393.16	.057	.086	-.482	.071	0.000	0.000
1640	3	393.02	97.26	26.05	34.00	-1.142	.567	.030	387.02	.018	.098	-.474	.080	0.000	0.000
1723	1	291.31	79.46	81.39	32.18	-.791	-2.328	.021	300.83	-.055	.114	-.131	.256	0.000	0.000
1723	2	294.77	78.78	81.78	32.28	-.779	-2.559	.010	304.35	.058	.111	-.133	.253	0.000	0.000
1723	3	302.09	81.01	80.82	32.61	-1.060	-2.709	.728	309.41	.053	.109	-.122	.248	0.000	0.000
1753	1	204.21	73.11	42.56	23.17	-.459	-1.428	-.029	208.54	-.055	.116	-.272	.231	0.000	0.000
1753	2	208.62	72.51	42.29	23.35	-.489	-1.665	.073	212.77	.064	.112	-.267	.223	0.000	0.000
1753	3	216.39	75.14	42.82	23.00	-.594	-1.574	.217	218.81	.039	.108	-.260	.227	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	AIR TEMP ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER THOUSAND	F	G
42267															
923	1	-.2522	-.0034	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
923	2	-.2327	.0440	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
923	3	-.2523	-.0160	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
953	1	-.1687	-.0051	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
953	2	-.1702	.0397	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
953	3	-.1704	-.0102	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1108	1	-.3404	-.0060	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1108	2	-.3340	.0418	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1108	3	-.3185	-.0232	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1158	1	-.0091	-.0001	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1158	2	.0098	-.0217	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1158	3	.0047	.0135	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1230	1	-.0272	.0034	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1230	2	-.0109	-.0163	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1230	3	-.0309	.0152	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1300	1	-.1107	-.0033	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1300	2	-.0914	-.0162	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1300	3	-.0995	.0081	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1411	1	-.2480	.0578	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1411	2	-.2488	-.0016	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1411	3	-.2300	-.0654	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1441	1	-.2820	.0584	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1441	2	-.2803	-.0026	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1441	3	-.2583	-.0698	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1515	1	-.2520	.0606	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1515	2	-.2545	-.0020	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1515	3	-.2403	-.0627	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1611	1	-.2115	.0625	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1611	2	-.1797	-.0064	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1611	3	-.1723	-.0653	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1640	1	-.5448	-.0452	0.0000	.0877	.0067	-.0221	12.	.1890	0.0000	0.0000	0.0000	0	0	0
1640	2	-.4976	.0512	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1640	3	-.4654	.0118	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1723	1	-.1471	-.0657	0.0000	.0652	.0951	-.0216	11.	.1730	0.0000	0.0000	0.0000	0	0	0
1723	2	-.1506	.0527	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1723	3	-.1382	.0449	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1753	1	-.2940	-.0655	0.0000	.2370	-.1043	-.0205	11.	.2930	0.0000	0.0000	0.0000	0	0	0
1753	2	-.2933	.0560	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1753	3	-.2818	.0295	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND	F ELEV	FSD ANGLE	G AZIM	GSD ANGLE	WIND DIR	WIND SHIFT
			WIND ST DEV			REYNOLDS STRESSES				RAD	RAD	RAD	RAD	RAD	RAD
		........CM/SEC..........				......DYNES/CM2......			CM/SEC						
42267															
1830	1	132.68	19.21	28.82	8.33	-.051	-.273	.048	135.48	-.054	.059	.217	.209	0.000	0.000
1830	2	130.45	24.04	30.12	8.93	-.020	-.502	-.048	133.74	.038	.065	.276	.230	0.000	0.000
1830	3	0.00	0.00	0.00	0.00	0.003	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1900	1	164.76	46.74	33.62	15.82	-.179	-.323	.039	167.72	-.057	.088	.097	.202	0.000	0.000
1900	2	166.58	46.98	33.90	16.07	-.151	-.411	-.032	169.72	.047	.090	.143	.204	0.000	0.000
1900	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1930	1	180.91	42.51	28.22	18.17	-.225	-.337	.012	182.61	-.059	.099	-.051	.150	0.000	0.000
1930	2	183.69	41.84	28.64	18.23	-.195	-.375	-.002	185.52	.055	.097	-.008	.149	0.000	0.000
1930	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
2000	1	190.10	40.30	34.65	20.78	-.268	-.487	-.007	192.75	-.060	.109	-.163	.180	0.000	0.000
2000	2	193.84	41.14	37.26	20.29	-.238	-.606	-.039	195.89	.062	.104	-.125	.186	0.000	0.000
2000	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
2030	1	183.16	51.64	38.83	20.76	-.290	-.517	.018	197.11	-.054	.135	-.247	.237	0.000	0.000
2030	2	191.61	41.24	40.50	20.77	-.279	-.576	-.024	195.76	.064	.109	-.215	.226	0.000	0.000
2030	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
42567															
900	1	254.72	66.00	59.28	28.77	-.671	-.358	.123	261.59	.003	.121	-.273	.235	0.000	0.000
900	2	253.28	63.81	64.68	30.31	-.712	-.527	-.133	261.22	.004	.125	-.158	.251	0.000	0.000
900	3	264.59	66.89	59.06	28.84	-.734	-.675	.205	265.51	-.008	.119	-.227	.232	0.000	0.000
945	1	267.36	75.54	76.80	31.08	-.724	0.000	.247	277.90	.003	.123	-.230	.282	0.000	0.000
945	2	266.58	72.64	82.60	31.26	-.728	-.006	-.216	278.47	-.001	.121	-.114	.298	0.000	0.000
945	3	275.35	74.55	74.27	32.34	-.814	-.454	.562	278.77	0.000	.126	-.188	.272	0.000	0.000
1015	1	312.69	92.87	80.88	32.16	-1.126	-2.146	.365	322.84	.012	.112	-.301	.257	0.000	0.000
1015	2	316.66	87.30	91.19	33.00	-.764	-2.753	-.250	329.01	.005	.109	-.206	.279	0.000	0.000
1015	3	392.64	66.71	82.61	29.77	-.565	-1.235	.812	394.64	-.010	.086	-.192	.225	0.000	0.000
1614	1	451.68	91.73	64.99	40.67	-1.267	.351	.202	456.20	.018	.094	.186	.142	0.000	0.000
1614	2	450.51	94.18	78.89	41.59	-1.554	.455	-.182	456.97	-.015	.097	.229	.172	0.000	0.000
1614	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1713	1	230.62	43.39	31.24	21.05	-.279	-.167	.039	232.65	.015	.092	.154	.133	0.000	0.000
1713	2	229.56	43.23	35.89	21.11	-.289	-.379	-.022	232.22	-.015	.093	.170	.155	0.000	0.000
1713	3	237.46	42.12	35.10	20.18	-.210	-.321	0.000	237.59	-.007	.086	.166	.147	0.000	0.000
42667															
1330	1	196.33	116.64	53.23	24.03	-.621	1.241	0.000	202.81	.036	.215	.223	.316	0.000	0.000
1330	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1330	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1400	1	207.68	104.52	79.28	25.11	-.426	-.055	.176	220.59	.020	.173	.003	.360	0.000	0.000
1400	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1400	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1630	1	399.60	94.12	67.44	39.42	-1.268	-.504	.057	404.96	.003	.103	-.203	.162	0.000	0.000
1630	2	521.67	98.11	77.87	47.99	-1.280	-1.789	-.011	524.86	.097	.093	-.207	.145	0.000	0.000
1630	3	425.92	103.42	66.52	43.27	-1.437	-.572	-.074	422.20	-.007	.112	-.275	.165	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	AIR TEMP ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER THOUSAND	F	G
42267															
1830	1	.2049	-.0580	0.0000	.0234	.0028	-.0650	9.	.1790	0.0000	0.0000	0.0000	0	0	0
1830	2	.2526	.0390	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1830	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1900	1	.0868	-.0629	0.0000	.1795	-.0356	-.0181	9.	.3190	0.0000	0.0000	0.0000	0	0	0
1900	2	.1306	.0467	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1900	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1930	1	-.0595	-.0654	0.0000	.1192	-.0129	-.0141	9.	.1940	0.0000	0.0000	0.0000	0	0	0
1930	2	-.0169	.0519	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1930	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2000	1	-.1743	-.0670	0.0000	.1130	-.0678	-.0166	9.	.2460	0.0000	0.0000	0.0000	0	0	0
2000	2	-.1379	.0586	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2000	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2030	1	-.2637	-.0642	0.0000	-.0017	.0259	-.0141	10.	.1890	0.0000	0.0000	0.0000	0	0	0
2030	2	-.2260	.0591	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2030	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
42567															
900	1	-.2745	-.0059	0.0000	-.1606	-.0180	.0876	10.	.4480	0.0000	0.0000	0.0000	0	0	0
900	2	-.1608	-.0063	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
900	3	-.2255	-.0187	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
945	1	-.2291	-.0056	0.0000	-.0769	.0805	.1487	11.	.8400	0.0000	0.0000	0.0000	0	0	0
945	2	-.1159	-.0115	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
945	3	-.1889	-.0098	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1015	1	-.3156	.0022	0.0000	-.5127	-.0246	.2212	13.	.8570	0.0000	0.0000	0.0000	0	0	0
1015	2	-.2256	-.0021	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1015	3	-.1949	-.0144	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1614	1	.1883	.0129	0.0000	-.2549	.1218	.0766	14.	.5140	0.0000	0.0000	0.0000	0	0	0
1614	2	.2310	-.0232	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1614	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1713	1	.1532	.0110	0.0000	.2458	-.0400	-.0382	10.	.5720	0.0000	0.0000	0.0000	0	0	0
1713	2	.1655	-.0200	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1713	3	.1604	-.0104	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
42667															
1330	1	.2894	.0191	0.0000	.0962	-.1261	.1324	15.	1.0100	.4048	-.0617	.3524	0	0	0
1330	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.000	0.0000	0	0	0
1330	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1400	1	-.0027	.0075	0.0000	-.0868	-.0340	.1300	15.	.8470	.3419	-.4065	.3491	0	0	0
1400	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1400	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0		0
1630	1	-.2068	-.0041	0.0000	.0231	.0313	-.0180	13.	.3100	-.3334	.0130	.0554	0	0	0
1630	2	-.2139	.0942	0.0000	.0040	-.0013	-.0166	13.	.1680	0.0000	0.0000	0.0000	0	0	0
1630	3	-.2726	-.0153	0.0000	.0803	-.0347	-.0251	10.	.2270	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		....	WIND ST DEV ....CM/SEC..........			REYNOLDS STRESSES ......DYNES/CM2.......									
42667															
1700	1	394.20	90.33	61.22	38.28	-1.196	.013	.151	398.76	.005	.100	-.169	.151	0.000	0.000
1700	2	512.94	92.36	69.67	46.16	-1.278	649	.024	515.71	.386	.092	-.174	.134	0.000	0.000
1700	3	425.03	104.19	63.92	42.99	-1.395	-.399	-.081	422.77	-.007	.112	-.236	.157	0.000	0.000
1730	1	414.43	92.79	54.88	37.93	-1.311	.491	.070	417.82	-.003	.096	-.354	.128	0.000	0.000
1730	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1730	3	432.30	100.55	45.43	41.36	-1.366	.635	-.175	419.10	-.001	.108	-.419	.117	0.000	0.000
1800	1	377.75	82.02	46.05	34.55	-.970	.117	.038	380.37	-.001	.095	-.369	.119	0.000	0.000
1800	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1800	3	405.39	100.10	40.47	39.36	-1.348	1.460	-.154	391.38	.001	.115	-.447	.116	0.000	0.000
1900	1	271.67	62.02	37.34	27.09	-.661	-.196	.080	274.17	.004	.106	-.276	.138	0.000	0.000
1900	2	362.88	61.52	60.33	35.56	-.853	1.464	-.419	364.41	.140	.100	-.322	.165	0.000	0.000
1900	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1930	1	256.91	57.17	35.75	24.50	-.465	-.243	.026	259.25	-.001	.098	-.272	.136	0.000	0.000
1930	2	339.07	53.52	59.39	31.55	-.556	1.455	-.501	341.11	.138	.093	-.315	.176	0.000	0.000
1930	3	226.94	69.78	55.58	31.90	-.727	.075	-.077	230.78	-.004	.176	-.034	.265	0.000	0.000
2000	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
2000	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
2000	3	205.77	73.29	38.95	29.77	-.539	.873	-.254	209.78	.009	.208	-.447	.235	0.000	0.000
42767															
930	1	458.69	124.30	104.94	45.26	-1.968	.870	.202	460.29	0.000	.108	-.218	.227	0.000	0.000
930	2	564.70	120.39	131.83	54.13	-1.615	1.462	-.528	579.86	.040	.099	-.066	.238	0.000	0.000
930	3	479.21	128.44	98.91	48.42	-1.631	-.439	-.171	482.00	-.004	.106	-.169	.207	0.000	0.000
1000	1	420.42	107.84	111.74	43.94	-1.653	-2.627	.241	434.64	.001	.109	-.114	.258	0.000	0.000
1000	2	535.34	120.79	134.38	52.52	-1.652	-4.446	-1.346	551.39	.040	.100	.014	.247	0.000	0.000
1000	3	455.61	121.34	112.10	45.92	-1.650	-3.398	-.237	462.20	-.005	.108	-.087	.243	0.000	0.000
1030	1	422.00	119.38	109.12	42.57	-1.592	-1.490	.328	435.79	0.000	.105	-.168	.258	0.000	0.000
1030	2	534.32	147.77	125.21	46.85	-2.259	1.935	-.899	548.77	.042	.094	-.063	.240	0.000	0.000
1030	3	451.30	115.04	95.01	44.97	-1.423	.006	-.196	423.07	-.001	.105	-.200	.214	0.000	0.000
1100	1	405.70	119.85	121.70	42.15	-1.618	-1.846	.446	423.09	.003	.107	-.032	.293	0.000	0.000
1100	2	498.94	139.06	135.26	51.08	-2.105	.788	-1.870	516.77	.040	.108	.107	.274	0.000	0.000
1100	3	424.64	115.91	120.75	42.72	-1.279	-1.693	-.569	432.71	-.009	.104	-.033	.278	0.000	0.000
1130	1	412.00	114.36	85.14	39.55	-1.212	1.863	.281	420.78	.004	.102	.254	.214	0.000	0.000
1130	2	501.54	142.03	83.01	42.42	-1.272	1.530	-.743	507.90	.009	.090	.381	.175	0.000	0.000
1130	3	426.16	127.97	93.40	40.25	-1.267	.981	-.153	424.95	-.018	.105	.283	.232	0.000	0.000
1200	1	473.71	120.97	66.74	40.02	-1.371	.919	.069	477.94	.009	.091	.394	.134	0.000	0.000
1200	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1200	3	494.01	129.31	78.74	42.62	-1.383	-.017	.158	484.23	-.019	.097	.370	.173	0.000	0.000
1400	1	515.13	124.89	128.58	51.92	-2.335	-3.435	.587	529.74	.003	.105	-.003	.230	0.000	0.000
1400	2	575.53	131.51	151.65	57.50	-2.215	-2.431	-1.797	691.18	.037	.089	.046	.214	0.000	0.000
1400	3	542.87	128.24	122.04	55.24	-2.190	-1.632	-.312	550.13	-.008	.106	-.015	.217	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER THOUSAND	F	G
42667															
1700	1	-.1697	-.0018	0.0000	.2009	.0273	-.0333	13.	.2270	-.2040	.0090	.0283	0	0	0
1700	2	-.1780	.0831	0.0000	.1221	.0332	-.0382	13.	.2110	0.0000	0.0000	0.0000	0	0	0
1700	3	-.2345	-.0146	0.0000	.1020	.0015	-.0346	10.	.2130	0.0000	0.0000	0.0000	0	0	0
1730	1	-.3536	-.0105	0.0000	.3586	.0626	-.0590	12.	.3100	-.0507	-.0063	-.0042	0	0	0
1730	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1730	3	-.4059	-.0083	0.0000	.2896	.0651	-.0699	11.	.2910	0.0000	0.0000	0.0000	0	0	0
1800	1	-.3704	-.0073	0.0000	.3087	.0110	-.0517	11.	.2920	.0410	-.0016	-.0170	0	0	0
1800	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1800	3	-.4262	-.0077	0.0000	.4335	.0565	-.0752	12.	.3080	0.0000	0.0000	0.0000	0	0	0
1900	1	-.2797	-.0035	0.0000	.2417	-.0154	-.0530	10.	.2640	.0967	-.0042	-.0266	0	0	0
1900	2	-.3162	.1361	0.0000	.1906	.0595	-.0674	10.	.2310	0.0000	0.0000	0.0000	0	0	0
1900	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1930	1	-.2764	-.0081	0.0000	.1647	.0338	-.0336	9.	.2520	.0521	.0205	-.0167	0	0	0
1930	2	-.3080	.1359	0.0000	.0954	.1232	-.0490	10.	.1980	0.0000	0.0000	0.0000	0	0	0
1930	3	-.0329	-.0219	0.0000	.0967	2.2453	-.1863	14.	.2520	0.0000	0.0000	0.0000	0	0	0
2000	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2000	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2000	3	-.4174	-.0094	0.0000	-.0594	.1603	-.1271	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
42767															
930	1	-.2132	-.0104	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
930	2	-.0632	.0259	0.0000	-.3666	.0974	.2155	11.	.4690	0.0000	0.0000	0.0000	0	0	0
930	3	-.1673	-.0104	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1000	1	-.1256	-.0075	0.0000	-.6398	-.0823	.2496	12.	.7420	-.9212	-.4682	.3349	0	0	0
1000	2	.0032	.0362	0.0000	-.3979	-.0298	.2554	11.	.5570	0.0000	0.0000	0.0000	0	0	0
1000	3	-.0961	-.0138	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1030	1	-.1736	-.0077	0.0000	-.9508	.0798	.2347	13.	.7740	-.9138	-.1857	.3448	0	0	0
1030	2	-.0566	.0361	0.0000	-.0701	.1219	.2640	12.	.6330	0.0000	0.0000	0.0000	0	0	0
1030	3	-.1965	-.0078	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1100	1	-.0406	-.0060	0.0000	-.6709	-.2863	.2285	13.	.8920	-.9550	-.2748	.3419	0	0	0
1100	2	.1073	.0342	0.0000	-.4894	-.3363	.5270	12.	.6140	0.0000	0.0000	0.0000	0	0	0
1100	3	-.0396	-.0167	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1130	1	.2664	-.0027	0.0000	-.6445	-.0829	.2367	13.	.9110	[illegible]	.1907	.3335	0	0	0
1130	2	.3947	.0053	0.0000	-.5910	.0036	.2052	12.	.5900	0.0000	0.0000	0.0000	0	0	0
1130	3	[illegible]	-.0247	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1200	1	.3998	.0035	0.0000	-.6698	-.0040	.2079	13.	.8390	-1.0630	.1221	.3613	0	0	0
1200	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1200	3	.3597	-.0246	0.0000	-.2260	-.1376	.2217	14.	.8130	0.0000	0.0000	0.0000	0	0	0
1400	1	-.0145	-.0042	0.0000	-.7450	.1414	.1849	13.	.6520	-1.5430	.2569	.3702	0	0	0
1400	2	.0414	.0343	0.0000	-.5774	.0585	[illegible]	[illegible]	.5250	0.0000	0.0000	0.0000	0	0	0
1400	3	-.0188	-.0159	0.0000	-.8601	.0540	.7044	14.	.6490	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC..........				......DYNES/CM2.......									
42767															
1430	1	494.93	118.19	116.21	50.82	-2.322	-1.097	.595	507.95	.003	.107	-.093	.227	0.000	0.000
1430	2	642.40	116.65	133.25	56.89	-2.456	.400	-.961	655.04	.052	.091	-.048	.202	0.000	0.000
1430	3	548.77	126.63	122.30	55.15	-2.219	-2.071	-.237	555.47	-.011	.104	-.069	.218	0.000	0.000
1500	1	434.31	104.37	110.66	44.45	-1.472	1.750	.467	447.35	.007	.107	.108	.239	0.000	0.000
1500	2	557.22	108.71	137.66	56.36	-2.185	3.969	-1.393	572.67	.035	.094	.160	.232	0.000	0.000
1500	3	480.81	109.90	121.16	46.84	-1.832	2.582	-.307	487.55	-.011	.103	.112	.243	0.000	0.000
1530	1	486.37	115.82	112.23	48.84	-1.947	2.276	.480	499.10	.002	.104	.013	.229	0.000	0.000
1530	2	624.85	124.71	134.38	53.76	-2.326	2.123	-1.095	638.99	.035	.089	.081	.218	0.000	0.000
1530	3	513.45	114.91	115.28	50.26	-1.842	3.256	-.299	520.33	-.014	.102	.044	.227	0.000	0.000
1600	1	494.72	120.76	84.21	50.05	-2.044	.437	.251	501.72	.005	.105	.064	.169	0.000	0.000
1600	2	652.61	120.66	97.55	54.10	-1.993	-1.391	-.544	666.29	.033	.084	.113	.145	0.000	0.000
1600	3	545.42	111.19	99.92	53.58	-1.965	-.066	-.068	549.77	-.013	.102	.073	.181	0.000	0.000
1630	1	524.00	115.97	101.82	52.75	-2.282	.589	.208	533.61	.002	.105	-.051	.191	0.000	0.000
1630	2	694.52	107.58	118.27	57.82	-2.215	-.495	-.880	703.91	.044	.085	.010	.169	0.000	0.000
1630	3	580.22	117.09	112.06	55.64	-2.179	-.381	-.318	585.71	-.011	.100	-.057	.191	0.000	0.000
1700	1	408.37	136.15	106.59	41.93	-1.430	3.343	0.000	420.56	-.001	.100	-.241	.245	0.000	0.000
1700	2	589.37	155.52	145.30	44.83	-1.418	1.304	-.652	605.23	.041	.074	-.211	.232	0.000	0.000
1700	3	452.14	152.28	99.73	44.53	-1.568	-.572	-.315	452.76	0.000	.109	-.232	.227	0.000	0.000
1800	1	327.77	89.74	41.76	30.33	-.820	-.171	.004	330.10	.010	.097	.380	.120	0.000	0.000
1800	2	419.82	84.42	56.76	38.38	-.996	-.484	-.282	423.16	.014	.094	.392	.130	0.000	0.000
1800	3	335.77	115.64	41.93	29.03	-.380	-2.497	-.080	320.41	-.025	.129	.493	.174	0.000	0.000
1900	1	184.89	39.66	29.20	16.26	-.196	.018	.038	187.01	-.006	.096	-.010	.149	0.000	0.000
1900	2	274.11	37.93	33.78	2.92	-.207	-.019	.111	275.96	.036	.069	0.000	.117	0.000	0.000
1900	3	213.47	41.93	31.78	19.28	-.244	-.198	-.002	214.63	-.012	.090	-.042	.144	0.000	0.000
1930	1	291.01	59.46	39.99	29.96	-.626	.049	.054	293.69	-.007	.107	-.221	.138	0.000	0.000
1930	2	397.97	56.56	42.60	30.83	-.625	.310	-.050	399.72	.050	.079	-.198	.106	0.000	0.000
1930	3	316.37	60.83	40.19	30.28	-.709	-.226	-.017	314.76	-.005	.100	-.211	.129	0.000	0.000
2000	1	247.86	60.14	38.52	24.84	-.416	1.000	.007	250.68	-.003	.101	-.135	.149	0.000	0.000
2000	2	357.02	62.92	43.04	25.88	-.451	1.452	-.105	359.28	.037	.073	-.102	.117	0.000	0.000
2000	3	280.52	64.95	40.41	26.81	-.530	.508	-.016	281.34	-.011	.097	-.115	.143	0.000	0.000
2030	1	158.24	92.71	37.01	18.98	-.159	-2.215	.050	162.44	-.006	.116	.173	.260	0.000	0.000
2030	2	226.33	124.34	41.92	23.52	-.296	-3.487	.009	230.61	.038	.120	.160	.246	0.000	0.000
2030	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
2300	1	149.65	19.26	22.85	10.60	-.065	.083	.011	151.35	-.005	.069	-.035	.149	0.000	0.000
2300	2	263.88	25.67	33.90	11.54	-.094	.109	-.071	265.77	.041	.043	-.125	.126	0.000	0.000
2300	3	165.15	23.43	23.80	10.98	-.068	-.120	-.017	164.54	-.016	.066	-.208	.143	0.000	0.000
2330	1	143.43	25.86	22.48	12.55	-.109	-.052	.020	145.19	0.000	.087	0.000	.158	0.000	0.000
2330	2	246.05	26.78	.08	14.11	-.049	.016	.159	247.27	.038	.057		27.302	0.000	0.000
2330	3	154.89	21.07	21.22	11.41	-.076	-.087	-.011	155.36	-.019	.073	-.095	.136	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS	....CAL/(CM2-MIN)....		CENTIGRADE		LATENT HEAT TRANS	....CAL/(CM2-MIN).....		PARTS PER THOUSAND		
42767															
1430	1	-.0963	-.0056	0.0000	-.5887	.0146	.1544	13.	.5580	-1.4133	-.0543	.3692	0	0	0
1430	2	-.0478	.0481	0.0000	-.3988	-.0367	.1867	12.	.4800	0.0000	0.0000	0.0000	0	0	0
1430	3	-.0728	-.0188	0.0000	-.5894	-.0016	.1610	14.	.5130	0.0000	0.0000	0.0000	0	0	0
1500	1	.1145	.0001	0.0000	-.4478	.0274	.1323	14.	.5480	-1.0473	.3661	.3399	0	0	0
1500	2	.1704	.0301	0.0000	-.3917	-.0568	.1350	13.	.4200	0.0000	0.0000	0.0000	0	0	0
1500	3	.1170	-.0199	0.0000	-.5244	-.0163	.1318	14.	.5150	0.0000	0.0000	0.0000	0	0	0
1530	1	.0218	-.0051	0.0000	-.4027	-.0001	.1053	14.	.4810	-1.0723	.0024	.2797	0	0	0
1530	2	.0877	.0313	0.0000	-.4147	-.0652	.1290	13.	.3750	0.0000	0.0000	0.0000	0	0	0
1530	3	.0533	-.0208	0.0000	-.4782	-.1537	.1110	14.	.4910	0.0000	0.0000	0.0000	0	0	0
1600	1	.0664	-.0027	0.0000	-.1922	-.1461	.0250	13.	.5680	0.0000	0.0000	0.0000	0	0	0
1600	2	.1114	.0228	0.0000	-.1275	-.0892	.0399	12.	.3560	0.0000	0.0000	0.0000	0	0	0
1600	3	.0726	-.0200	0.0000	-.0234	-.1158	.0232	13.	.4240	0.0000	0.0000	0.0000	0	0	0
1630	1	-.0501	-.0055	0.0000	-.0554	.0080	.0038	12.	.3430	-.7234	-.0093	.1577	0	0	0
1630	2	-.0114	.0408	0.0000	-.0885	.0250	.0255	12.	.1710	0.0000	0.0000	0.0000	0	0	0
1630	3	-.0567	-.0176	0.0000	-.0779	-.0477	.0049	13.	.2130	0.0000	0.0000	0.0000	0	0	0
1700	1	-.2466	-.0088	0.0000	1.1628	.0407	-.0045	11.	.4690	-1.0444	-.4505	.0814	0	0	0
1700	2	-.2145	.0409	0.0000	.2591	.4824	-.0033	11.	.4340	0.0000	0.0000	0.0000	0	0	0
1700	3	-.2368	-.0079	0.0000	-.4969	.4850	-.0859	12.	.4440	0.0000	0.0000	0.0000	0	0	0
1800	1	.3816	.0037	0.0000	.4592	-.1143	-.0733	9.	.5280	-.0497	-.0512	-.0065	0	0	0
1800	2	.3927	.0094	0.0000	.2272	-.1537	-.0368	10.	.3010	0.0000	0.0000	0.0000	0	0	0
1800	3	.4668	-.0260	0.0000	-.[illegible]878	-.3295	-.0641	10.	.5020	0.0000	0.0000	0.0000	0	0	0
1900	1	-.0096	-.0109	0.0000	.2456	.0108	-.0486	6.	.6160	.0869	-.0181	-.0329	0	0	0
1900	2	.0006	.0290	0.0000	.0837	.0218	-.0276	9.	.2430	0.0000	0.0000	0.0000	0	0	0
1900	3	-.0456	-.0169	0.0000	.2093	.0115	-.0577	7.	.5460	.1016	.0046	.0017	0	0	0
1930	1	-.2228	-.0136	0.0000	.2704	-.0010	-.0711	6.	.4080	.1232	.0046	-.0400	0	0	0
1930	2	-.1972	.0471	0.0000	.1662	.0419	-.0549	7.	.2550	0.0000	0.0000	0.0000	0	0	0
1930	3	-.2115	-.0120	0.0000	.2909	.0038	-.0803	7.	.4030	0.0000	0.0000	0.0000	0	0	0
2000	1	-.1234	-.0094	0.0000	.1987	-.0146	-.0568	5.	.4320	.1334	.0151	-.0348	0	0	0
2000	2	-.0941	.0350	0.0000	.0087	-.0596	-.0351	6.	.2590	0.0000	0.0000	0.0000	0	0	0
2000	3	-.1100	-.0169	0.0000	.2564	-.0184	-.0665	6.	.4280	0.0000	0.0000	0.0000	0	0	0
2030	1	.0342	-.0092	0.0000	.6790	-.1247	-.0367	5.	.6110	.0969	-.0365	-.0262	0	0	0
2030	2	.0829	.0339	0.0000	.5215	-.1006	-.0319	6.	.3330	0.0000	0.0000	0.0000	0	0	0
2030	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2300	1	-.0329	-.0030	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2300	2	-.1244	.0408	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2300	3	-.[illegible]2	-.0190	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2330	1	-.0029	-.0047	0.0000	.0823	-.0191	-.0279	2.	.9370	.0609	-.0001	-.0201	0	0	0
2330	2	-1.5704	.0374	0.0000	-.0001	-.0409	-.0044	2.	.1970	0.0000	.0081	0.0000	0	0	0
2330	3	-.0981	-.0219	0.0000	.0454	-.0234	-.0176	2.	1.3870	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		........CM/SEC	WIND ST DEV	....		......DYNES/CM2	REYNOLDS STRESSES	....							
42867															
	1	104.27	12.38	18.09	4.18	-.005	.127	.010	105.81	-.002	.039	.075	.171	0.000	0.000
	2	180.35	18.66	28.56	8.03	-.007	-.344	-.052	182.50	.032	.043	-.002	.159	0.000	0.000
	3	115.67	12.22	22.79	4.83	-.011	-.027	-.012	116.90	-.022	.039	-.028	.197	0.000	0.000
30	1	110.08	24.58	31.57	8.28	-.032	-.101	.014	114.44	-.002	.081	.026	.279	0.000	0.000
30	2	200.90	25.96	51.27	10.39	-.006	-.718	-.156	207.18	.035	.049	-.046	.251	0.000	0.000
30	3	118.46	20.87	32.12	6.25	-.008	-.209	-.044	120.73	-.019	.052	-.060	.268	0.000	0.000
100	1	135.61	33.02	24.25	12.10	-.103	-.285	.012	137.96	0.000	.085	-.236	.196	0.000	0.000
100	2	228.66	41.33	24.77	14.31	-.121	-.113	-.025	229.64	.051	.061	-.337	.114	0.000	0.000
100	3	156.94	28.82	21.86	12.33	-.077	-.225	0.000	154.47	-.009	.079	-.319	.156	0.000	0.000
130	1	102.48	31.61	19.65	8.15	-.044	-.216	.012	104.17	-.004	.069	-.160	.179	0.000	0.000
130	2	189.93	41.76	26.49	9.88	-.056	.103	-.034	191.43	.045	.049	-.282	.134	0.000	0.000
130	3	118.73	31.90	20.62	10.13	-.050	-.171	-.010	118.36	-.009	.087	-.227	.180	0.000	0.000
230	1	73.78	27.34	19.28	1.63	-.002	-.160	.006	76.51	-.009	.036	-.158	.301	0.000	0.000
230	2	150.90	29.57	26.06	3.27	-.016	.080	-.044	152.94	.037	.020	-.103	.169	0.000	0.000
230	3	83.51	31.14	21.35	2.05	-.018	-.059	-.015	84.60	-.003	.072	-.249	.335	0.000	0.000
400	1	104.42	41.09	26.28	9.44	-.052	.501	.007	107.43	.017	.078	-.001	.240	0.000	0.000
400	2	167.04	51.26	40.28	16.69	-.195	.675	-.110	171.56	.016	.099	.163	.234	0.000	0.000
400	3	102.98	44.77	25.11	8.52	-.082	.355	-.022	104.66	-.003	.085	-.030	.273	0.000	0.000
430	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
430	2	137.42	31.33	26.00	6.56	-.016	-.074	-.029	139.63	.046	.057	-.373	.190	0.000	0.000
430	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
500	1	93.33	32.06	21.67	8.06	-.044	.181	.013	95.76	.016	.087	-.305	.234	0.000	0.000
500	2	153.75	37.60	31.35	14.20	-.108	.448	.003	156.86	.040	.089	-.234	.209	0.000	0.000
500	3	107.88	25.64	21.12	8.17	-.035	.225	-.015	108.32	0.000	.079	-.221	.226	0.000	0.000
700	1	112.83	55.52	43.69	15.34	-.198	.677	.007	119.87	.017	.159	-.128	.334	0.000	0.000
700	2	140.27	60.17	53.29	21.25	-.147	.283	-.142	148.54	.023	.145	-.002	.317	0.000	0.000
700	3	138.30	40.50	56.98	16.35	-.161	-.190	-.098	144.47	.003	.137	-.067	.400	0.000	0.000
50267															
1430	1	197.06	147.94	88.34	23.31	-.430	.204	.187	210.44	.010	.144	.018	.346	0.000	0.000
1430	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1430	3	188.13	141.87	73.29	20.12	-.231	-2.206	-.090	200.44	.009	.160	.015	.350	0.000	0.000
1530	1	267.63	106.13	82.60	29.42	-.695	2.544	.172	279.52	.011	.128	.042	.319	0.000	0.000
1530	2	334.80	119.68	98.82	17.77	-.359	5.731	-.340	351.87	.009	.060	.048	.323	0.000	0.000
1530	3	271.62	101.65	79.34	24.52	-.475	1.324	-.213	283.21	-.008	.109	-.030	.269	0.000	0.000
1600	1	290.65	82.73	87.67	29.61	-.674	.992	.166	302.72	.007	.105	.091	.283	0.000	0.000
1600	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1600	3	308.84	70.71	66.78	26.24	-.555	-.190	-.148	316.79	-.010	.087	.024	.210	0.000	0.000
1630	1	394.64	95.60	83.86	39.88	-1.246	-1.401	.197	403.24	.006	.105	.065	.209	0.000	0.000
1630	2	508.92	118.84	89.59	43.81	-1.317	-2.640	-.443	518.16	.016	.091	.081	.183	0.000	0.000
1630	3	410.75	88.27	77.23	35.05	-.822	-.698	-.247	418.63	-.014	.086	.004	.181	0.000	0.000

D10A

CORRECTED DATA FOR SITE 3, MAY 2, 1967, Pages D10-D15

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND	F ELEV	FSD ANGLE	G AZIM	GSD ANGLE
			WIND ST DEV			REYNOLDS STRESSES							
		..........CM/SEC..........				......DYNES/CM2.......			CM/SEC	RAD	RAD	RAD	RAD
50267													
1430	3	188.53	142.71	86.14	23.70	-.269	-2.912	-.129	200.44	.011	.188	.017	.412
1530	3	271.64	101.64	93.44	28.88	-.564	1.531	-.296	283.21	-.010	.129	-.036	.317
1600	3	308.88	70.74	78.65	30.90	-.661	-.168	-.204	316.79	-.012	.103	.028	.247
1630	3	410.78	88.33	90.96	41.28	-.982	-.818	-.342	418.63	-.017	.102	.005	.213
1705	3	478.04	101.69	73.00	46.59	-1.578	-.407	-.037	481.29	-.007	.101	-.178	.153
1735	3	333.08	75.51	44.78	30.74	-.688	-1.038	-.067	333.11	-.005	.096	-.291	.138
1800	3	273.05	62.06	37.56	26.32	-.450	-.346	.011	274.58	-.008	.097	-.145	.136
1830	3	212.27	45.88	34.88	18.98	-.217	-.394	-.025	213.94	-.023	.088	.188	.163
1900	3	186.54	37.70	20.13	15.04	-.152	-.003	-.011	186.20	-.029	.079	.266	.105
1930	3	201.85	38.69	28.44	18.40	-.210	.064	-.017	203.20	-.019	.091	-.116	.139
2000	3	205.29	37.89	27.96	19.93	-.271	-.089	-.009	206.50	-.016	.098	-.133	.136
2030	3	211.00	40.42	29.71	20.82	-.291	-.163	-.011	212.19	-.013	.100	-.160	.140
2100	3	192.26	38.80	15.94	15.36	-.185	.109	-.017	189.86	-.001	.080	-.440	.083
2136	3	180.94	35.10	22.95	15.90	-.169	.081	-.021	180.27	-.005	.086	-.356	.123
2200	3	198.64	42.91	28.88	17.80	-.185	-.261	-.019	199.35	-.008	.088	-.237	.143
2230	3	183.71	30.43	27.31	16.61	-.173	.019	-.003	185.30	-.012	.091	-.061	.148
2305	3	166.17	33.72	23.28	15.61	-.153	-.284	-.006	167.36	-.010	.093	-.090	.142
2330	3	160.92	48.60	24.48	14.63	-.119	-.528	0.000	161.93	-.029	.082	.172	.144

TIME START	SITE	ETA	THETA	BETA	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW
					SENSIBLE HEAT TRANS					LATENT HEAT TRANS		
		RAD	RAD	RAD	....CAL/(CM2-MIN)....			CENTIGRADE		....CAL/(CM2-MIN).....		
50267												
1430	3	-.1226	-.0115	0.0000	.5517	-.3752	.0267	20.	.5150	0.0000	0.0000	0.0000
1530	3	-.0100	-.0204	0.0000	-.0175	-.2040	.0485	20.	.3820	0.0000	0.0000	0.0000
1600	3	.0258	-.0199	0.0000	-.0737	-.0134	.0174	20.	.1670	0.0000	0.0000	0.0000
1630	3	.0007	-.0231	0.0000	-.0824	.0239	-.0144	19.	.2480	0.0000	0.0000	0.0000
1705	3	-.1802	-.0140	0.0000	.1850	.0071	-.0445	18.	.1560	0.0000	0.0000	0.0000
1735	3	-.2987	-.0110	0.0000	.4301	-.1190	-.0532	18.	.4750	0.0000	0.0000	0.0000
1800	3	-.1500	-.0142	0.0000	.5410	-.0664	-.0570	16.	.6640	0.0000	0.0000	0.0000
1830	3	.1810	-.0272	0.0000	.4629	-.1494	-.0337	13.	.9840	0.0000	0.0000	0.0000
1900	3	.2662	-.0329	0.0000	.0244	-.0036	-.0228	11.	.5290	0.0000	0.0000	0.0000
1930	3	-.1146	-.0239	0.0000	.1257	-.0002	-.0330	9.	.4090	0.0000	0.0000	0.0000
2000	3	-.1347	-.0219	0.0000	.1341	.0110	-.0345	9.	.3650	0.0000	0.0000	0.0000
2030	3	-.1636	-.0196	0.0000	.1919	-.0254	-.0356	8.	.3590	0.0000	0.0000	0.0000
2100	3	-.4340	-.0069	0.0000	.1668	.0046	-.0252	8.	.3200	0.0000	0.0000	0.0000
2136	3	-.3518	-.0099	0.0000	.1183	-.0280	-.0219	8.	.3000	0.0000	0.0000	0.0000
2200	3	-.2431	-.0124	0.0000	.1800	-.0070	-.0234	7.	.3280	0.0000	0.0000	0.0000
2230	3	-.0612	-.0179	0.0000	.3869	-.0318	-.0231	7.	.3010	0.0000	0.0000	0.0000
2305	3	-.1003	-.0151	0.0000	.1138	-.0241	-.0220	7.	.2970	0.0000	0.0000	0.0000
2330	3	.1557	-.0329	0.0000	.2535	-.0627	-.0159	6.	.3770	0.0000	0.0000	0.0000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS			CENTIGRADE		LATENT HEAT TRANS			PARTS PER THOUSAND		
					....CAL/(CM2-MIN)....					....CAL/(CM2-MIN).....					
42867															
	1	.0848	-.0031	0.0000	.0596	.0876	0.0000	2.	.5140	.0349	.0338	-.0010	0	0	0
	2	-.0114	.0329	0.0000	.0040	.0278	-.0049	2.	.2980	0.0000	0.0000	0.0000	0	0	0
	3	-.0300	-.0235	0.0000	.0348	.0268	-.0045	2.	.3610	0.0000	0.0000	0.0000	0	0	0
30	1	.0250	-.0048	0.0000	.0860	-.0692	-.0110	1.	.3810	0.0000	0.0000	0.0000	0	0	0
30	2	-.0578	.0361	0.0000	.0505	-.0409	-.0052	2.	.1760	0.0000	0.0000	0.0000	0	0	0
30	3	-.0696	-.0209	0.0000	.0722	-.1035	-.0004	1.	.4200	0.0000	0.0000	0.0000	0	0	0
100	1	-.2507	-.0046	0.0000	.1135	-.0335	-.0211	1.	.3120	0.0000	0.0000	0.0000	0	0	0
100	2	-.3412	.0505	0.0000	.1142	.0058	-.0132	2.	.2070	0.0000	0.0000	0.0000	0	0	0
100	3	-.3216	-.0122	0.0000	.1085	-.0472	-.0210	2.	.3500	0.0000	0.0000	0.0000	0	0	0
130	1	-.1730	-.0069	0.0000	.0591	-.0203	-.0098	1.	.2400	0.0000	0.0000	0.0000	0	0	0
130	2	-.2777	.0444	0.0000	.0520	.0031	-.0067	2.	.1390	0.0000	0.0000	0.0000	0	0	0
130	3	-.2335	-.0117	0.0000	.0634	-.0505	.0007	1.	.3370	0.0000	0.0000	0.0000	0	0	0
230	1	-.1647	-.0086	0.0000	.0671	-.0739	.0047	1.	.3390	0.0000	0.0000	0.0000	0	0	0
230	2	-.0975	.0369	0.0000	.0399	.0698	-.0042	2.	.5550	0.0000	0.0000	0.0000	0	0	0
230	3	-.2040	-.0160	0.0000	.1035	-.0083	-.0020	1.	.2630	0.0000	0.0000	0.0000	0	0	0
400	1	.0429	.0149	0.0000	-.0499	-.0084	-.0095	0.	.3710	0.0000	0.0000	0.0000	0	0	0
400	2	.1865	.0115	0.0000	.0328	.0899	-.0211	0.	.2700	0.0000	0.0000	0.0000	0	0	0
400	3	.0314	-.0147	0.0000	-.0301	.0353	-.0106	0.	.3600	0.0000	0.0000	0.0000	0	0	0
430	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
430	2	-.3717	.0467	0.0000	.0203	-.0147	-.0004	0.	.2500	0.0000	0.0000	0.0000	0	0	0
430	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
500	1	-.2752	.0125	0.0000	.0158	-.0385	-.0113	0.	.4100	0.0000	0.0000	0.0000	0	0	0
500	2	-.2152	.0382	0.0000	.0306	-.0245	-.0090	0.	.2260	0.0000	0.0000	0.0000	0	0	0
500	3	-.1927	-.0042	0.0000	-.0271	-.0687	-.0078	0.	.4410	0.0000	0.0000	0.0000	0	0	0
700	1	-.0960	.0029	0.0000	-.4100	-.0007	.0579	5.	.6260	-.2126	-.0687	.0596	0	0	0
700	2	.0045	.0204	0.0000	.0779	-.1765	.0673	4.	.3790	0.0000	0.0000	0.0000	0	0	0
700	3	-.0706	-.0062	0.0000	-.0353	-.1330	.0630	5.	.6000	0.0000	0.0000	0.0000	0	0	0
50267															
1430	1	-.0043	.0023	0.0000	-.3438	-.6081	.0584	20.	.5320	3.2180	-.5181	.1888	0	0	0
1430	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1430	3	-.1042	-.0098	0.0000	.5378	-.3193	.0226	20.	.5150	0.0000	0.0000	0.0000	0	0	0
1530	1	.0979	.0022	0.0000	-.4249	-.0266	.0396	20.	.2540	-.3104	.3970	.3265	0	0	0
1530	2	.1132	.0064	0.0000	-.2885	-.0634	.0314	20.	.2390	0.0000	0.0000	0.0000	0	0	0
1530	3	-.0084	-.0172	0.0000	-.0178	-.1732	.0412	20.	.3820	0.0000	0.0000	0.0000	0	0	0
1600	1	.0962	.0003	0.0000	-.1339	.0420	.0172	20.	.2940	-.6413	.1857	.2336	0	0	0
1600	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1600	3	.0219	-.0163	0.0000	-.0735	-.0114	.0148	20.	.1670	0.0000	0.0000	0.0000	0	0	0
1630	1	.0582	-.0002	0.0000	-.0884	.0816	-.0165	19.	.3130	-.5724	.0277	.1467	0	0	0
1630	2	.0741	.0114	0.0000	-.1707	.0277	-.0038	19.	.1660	0.0000	0.0000	0.0000	0	0	0
1630	3	.0006	-.0196	0.0000	-.0825	.0203	-.0122	19.	.2480	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC..........				......DYNES/CM2.......									
50267															
1705	1	451.49	106.91	83.19	43.10	-1.480	1.864	.025	458.68	0.000	.100	-.129	.177	0.000	0.000
1705	2	605.23	101.76	96.95	49.72	-2.040	1.217	-.338	614.26	.026	.084	-.127	.157	0.000	0.000
1705	3	475.88	101.02	62.25	39.55	-1.327	-.067	-.024	481.29	-.006	.086	-.151	.130	0.000	0.000
1735	1	329.45	73.92	46.26	30.97	-.701	-.724	.039	332.54	-.002	.097	-.248	.142	0.000	0.000
1735	2	419.78	67.77	58.71	34.90	-.883	-.934	-.132	425.56	.036	.084	-.236	.137	0.000	0.000
1735	3	329.02	73.76	38.49	26.10	-.580	-.711	-.047	333.11	-.004	.082	-.247	.117	0.000	0.000
1800	1	250.96	62.11	40.93	25.74	-.435	-.169	.039	254.18	.004	.103	-.090	.163	0.000	0.000
1800	2	351.83	57.78	43.08	25.69	-.414	-.410	-.022	354.84	.025	.072	-.088	.121	0.000	0.000
1800	3	272.19	61.69	31.99	22.34	-.378	-.232	.009	274.58	-.007	.082	-.123	.116	0.000	0.000
1830	1	206.65	52.31	35.05	20.59	-.281	-.493	.017	209.33	.009	.098	.256	.161	0.000	0.000
1830	2	292.00	51.22	44.72	22.06	-.255	-.983	-.066	296.97	.008	.073	.267	.150	0.000	0.000
1830	3	211.28	46.01	29.75	16.12	-.179	-.398	-.019	213.94	-.019	.075	.159	.138	0.000	0.000
1900	1	180.07	37.86	20.36	16.15	-.151	.004	.016	181.07	.010	.089	.331	.110	0.000	0.000
1900	2	268.23	33.81	23.36	17.67	-.141	.058	-.003	271.14	.002	.063	.329	.083	0.000	0.000
1900	3	184.71	37.33	17.25	12.77	-.125	-.034	-.009	186.20	-.025	.067	.226	.089	0.000	0.000
1930	1	192.72	40.41	28.26	19.02	-.239	-.004	.028	194.74	.004	.099	-.142	.146	0.000	0.000
1930	2	280.76	37.75	31.65	21.31	-.239	.046	-.033	282.88	.021	.075	-.096	.112	0.000	0.000
1930	3	201.47	38.58	24.19	15.62	-.176	.081	-.012	203.20	-.016	.077	-.098	.118	0.000	0.000
2000	1	201.11	41.46	30.22	20.98	-.303	-.091	.034	203.32	.005	.107	-.157	.151	0.000	0.000
2000	2	286.22	40.03	31.48	23.06	-.276	-.130	0.000	288.28	.026	.080	-.106	.109	0.000	0.000
2000	3	204.76	37.70	23.80	16.92	-.227	-.045	-.006	206.50	-.013	.083	-.113	.116	0.000	0.000
2030	1	194.38	42.08	29.20	19.80	-.260	-.086	.026	196.47	.004	.105	-.174	.149	0.000	0.000
2030	2	285.68	41.11	31.47	23.05	-.255	-.244	.035	287.89	.029	.080	-.144	.109	0.000	0.000
2030	3	210.20	40.11	25.32	17.68	-.244	-.096	-.007	212.19	-.011	.085	-.136	.118	0.000	0.000
2100	1	165.32	42.84	17.73	15.78	-.189	.441	-.020	166.11	-.001	.101	-.445	.108	0.000	0.000
2100	2	258.21	33.00	19.01	16.97	-.148	.033	.020	261.52	.041	.063	-.421	.070	0.000	0.000
2100	3	187.45	38.12	13.88	13.04	-.154	.122	-.012	189.86	-.001	.068	-.373	.070	0.000	0.000
2136	1	155.69	38.76	19.63	15.00	-.163	.314	-.010	156.79	.005	.100	-.375	.126	0.000	0.000
2136	2	25[illegible].12	32.81	32.04	17.83	-.182	-.092	-.061	256.48	.038	.067	-.285	.123	0.000	0.000
2136	3	177.91	34.73	19.82	13.50	-.142	.120	-.015	180.27	-.004	.073	-.302	.105	0.000	0.000
2200	1	185.77	45.00	34.49	18.84	-.272	.069	.005	188.91	.005	.104	-.126	.186	0.000	0.000
2200	2	276.39	45.26	40.54	20.44	-.243	-.266	-.061	279.70	.025	.073	.011	.148	0.000	0.000
2200	3	197.03	42.27	24.72	15.11	-.156	-.163	-.013	199.35	-.007	.074	-.201	.122	0.000	0.000
2230	1	167.54	31.20	25.21	16.66	-.200	.031	.009	169.43	.004	.102	-.122	.153	0.000	0.000
2230	2	258.87	30.10	28.84	17.72	-.180	.079	-.024	260.62	.020	.068	.013	.110	0.000	0.000
2230	3	183.61	30.41	23.20	14.10	-.145	.030	-.002	185.30	-.010	.077	-.052	.126	0.000	0.000
2305	1	134.98	46.27	24.45	14.13	-.167	-.629	.022	137.26	.008	.103	-.048	.197	0.000	0.000
2305	2	228.17	43.32	25.46	16.52	-.145	-.526	-.012	229.79	.024	.073	.024	.118	0.000	0.000
2305	3	165.93	33.47	19.79	13.25	-.128	-.225	-.004	167.36	-.008	.079	-.077	.121	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER THOUSAND		
50267															
1705	1	-.1218	-.0075	0.0000	.2710	.0821	-.0496	18.	.3050	-.4030	.0531	.0579	0	0	0
1705	2	-.1253	.0222	0.0000	.1475	.0454	-.0467	18.	.1890	0.0000	0.0000	0.0000	0	0	0
1705	3	-.1534	-.0119	0.0000	.1843	.0061	-.0378	18.	.1560	0.0000	0.0000	0.0000	0	0	0
1735	1	-.2550	-.0079	0.0000	.4034	-.1111	-.0682	17.	.4870	-.2328	.0112	.0212	0	0	0
1735	2	-.2426	.0326	0.0000	.2270	-.1429	-.0564	18.	.2990	0.0000	0.0000	0.0000	0	0	0
1735	3	-.2557	-.0094	0.0000	.4152	-.1023	-.0452	18.	.4750	0.0000	0.0000	0.0000	0	0	0
1800	1	-.0941	-.0018	0.0000	.5651	-.0478	-.0596	16.	.7120	-.0919	.0452	-.0399	0	0	0
1800	2	-.0919	.0225	0.0000	.3212	-.0496	-.0462	17.	.4410	0.0000	0.0000	0.0000	0	0	0
1800	3	-.1276	-.0121	0.0000	.5363	-.0565	-.0484	16.	.6640	0.0000	0.0000	0.0000	0	0	0
1830	1	.2496	.0037	0.0000	.5017	-.1373	-.0388	13.	.8570	.2014	-.0225	-.0374	0	0	0
1830	2	.2611	.0063	0.0000	.3263	-.1441	-.0201	15.	.7170	0.0000	0.0000	0.0000	0	0	0
1830	3	.1541	-.0232	0.0000	.4680	-.1274	-.0285	13.	.9840	0.0000	0.0000	0.0000	0	0	0
1900	1	.3340	.0066	0.0000	.0327	.0001	-.0409	11.	.5780	0.0000	0.0000	0.0000	0	0	0
1900	2	.3332	.0013	0.0000	-.1091	-.0427	-.0227	13.	.5790	0.0000	0.0000	0.0000	0	0	0
1900	3	.2275	-.0282	0.0000	.0243	-.0031	-.0194	11.	.5290	0.0000	0.0000	0.0000	0	0	0
1930	1	-.1425	-.0008	0.0000	.1526	-.0203	-.0406	9.	.4670	0.0000	0.0000	0.0000	0	0	0
1930	2	-.0962	.0192	0.0000	.0489	-.0133	-.0303	11.	.3620	0.0000	0.0000	0.0000	0	0	0
1930	3	-.0974	-.0203	0.0000	.1253	-.0002	-.0280	9.	.4090	0.0000	0.0000	0.0000	0	0	0
2000	1	-.1602	-.0015	0.0000	.1477	.0103	-.0384	9.	.3580	0.0000	0.0000	0.0000	0	0	0
2000	2	-.1088	.0239	0.0000	.0716	.0138	-.0316	10.	.2680	0.0000	0.0000	0.0000	0	0	0
2000	3	-.1145	-.0186	0.0000	.1339	.0094	-.0292	9.	.3650	0.0000	0.0000	0.0000	0	0	0
2030	1	-.1768	-.0014	0.0000	.1954	-.0122	-.0365	8.	.4010	0.0000	0.0000	0.0000	0	0	0
2030	2	-.1483	.0267	0.0000	.1363	-.0247	-.0279	10.	.3130	0.0000	0.0000	0.0000	0	0	0
2030	3	-.1393	-.0167	0.0000	.1898	-.0216	-.0303	8.	.3590	0.0000	0.0000	0.0000	0	0	0
2100	1	-.4332	-.0083	0.0000	.2255	.0357	-.0279	8.	.4470	0.0000	0.0000	0.0000	0	0	0
2100	2	-.4261	.0404	0.0000	.0666	-.0051	-.0201	10.	.2690	0.0000	0.0000	0.0000	0	0	0
2100	3	-.3748	-.0055	0.0000	.1631	.0040	-.0214	8.	.3200	0.0000	0.0000	0.0000	0	0	0
2136	1	-.3650	.0002	0.0000	.1811	.0201	-.0235	7.	.3960	.1349	.0103	-.0263	0	0	0
2136	2	-.2886	.0369	0.0000	.0226	-.0433	-.0163	9.	.2750	0.0000	0.0000	0.0000	0	0	0
2136	3	-.3021	-.0090	0.0000	.1137	-.0242	-.0186	8.	.3000	0.0000	0.0000	0.0000	0	0	0
2200	1	-.1252	-.0008	0.0000	.1898	.0446	-.0316	7.	.4020	.1629	.0327	-.0334	0	0	0
2200	2	.0075	.0230	0.0000	.1086	.0628	-.0277	9.	.3090	0.0000	0.0000	0.0000	0	0	0
2200	3	-.2075	-.0109	0.0000	.1780	-.0060	-.0198	7.	.3280	0.0000	0.0000	0.0000	0	0	0
2230	1	-.1214	-.0018	0.0000	.0923	-.0078	-.0287	7.	.2930	.0997	-.0039	-.0303	0	0	0
2230	2	.0144	.0187	0.0000	.0529	.0004	-.0175	8.	.2080	0.0000	0.0000	0.0000	0	0	0
2230	3	-.0520	-.0147	0.0000	.0862	-.0270	-.0196	7.	.3010	0.0000	0.0000	0.0000	0	0	0
2305	1	-.0831	.0007	0.0000	.2318	-.0636	-.0253	6.	.3860	.1768	-.0426	-.0254	0	0	0
2305	2	.0145	.0223	0.0000	.1102	-.0268	-.0171	8.	.2730	0.0000	0.0000	0.0000	0	0	0
2305	3	-.0852	-.0129	0.0000	.1129	-.0205	-.0187	7.	.2970	0.0000	0.0000	0.0000	0	0	0

D13

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC..........				......DYNES/CM2.......									
50267															
2330	1	171.43	42.73	30.94	17.83	-.208	-.359	.043	174.06	.012	.102	.123	.174	0.000	0.000
2330	2	254.72	44.21	32.41	18.69	-.173	-.548	-.024	257.88	.011	.070	.244	.124	0.000	0.000
2330	3	160.35	48.79	20.85	12.42	-.098	-.475	0.000	161.93	-.024	.069	.146	.122	0.000	0.000
50367															
	1	201.89	39.19	37.61	21.27	-.304	-.054	.022	205.15	.009	.108	.089	.181	0.000	0.000
	2	292.61	38.20	39.01	22.48	-.273	-.164	-.042	296.41	.013	.077	.216	.134	0.000	0.000
	3	189.34	37.79	33.93	18.62	-.233	.240	-.046	191.68	-.017	.098	.102	.185	0.000	0.000
1130	1	106.66	68.73	44.44	13.46	-.146	-.299	.081	113.35	.001	.231	-.160	.379	0.000	0.000
1130	2	134.55	91.87	54.31	26.64	.191	-2.048	-.162	145.70	.002	.230	-.111	.389	0.000	0.000
1130	3	110.33	89.59	42.36	19.31	-.122	-.921	-.150	115.28	.015	.209	-.174	.374	0.000	0.000
1230	1	210.72	122.18	68.31	23.70	-.347	1.680	.199	219.82	.008	.144	.173	.312	0.000	0.000
1230	2	249.29	127.89	85.32	34.21	-.619	2.107	-.483	263.86	.007	.168	.213	.315	0.000	0.000
1230	3	220.58	106.64	69.93	27.75	-.633	.617	-.250	226.94	-.013	.159	.274	.296	0.000	0.000
1306	1	273.55	105.74	43.23	25.26	-.522	-.664	.006	276.14	.013	.098	.354	.159	0.000	0.000
1306	2	329.60	104.24	59.66	36.68	-.677	-2.287	-.034	337.81	.007	.125	.395	.166	0.000	0.000
1306	3	272.74	98.86	49.49	28.30	-.654	-1.320	-.059	273.36	-.015	.128	.370	.186	0.000	0.000
1330	1	224.96	102.04	70.95	25.11	-.171	2.563	.184	235.52	-.002	.137	.089	.331	0.000	0.000
1330	2	270.57	118.12	84.32	33.96	-.276	3.350	-.397	284.72	0.000	.163	.102	.312	0.000	0.000
1330	3	238.23	106.37	75.81	26.45	-.682	3.307	-.254	247.39	-.008	.154	.082	.343	0.000	0.000
1400	1	197.21	81.11	62.66	19.40	-.238	1.460	.099	196.27	.005	.127	.070	.314	0.000	0.000
1400	2	219.99	86.28	80.04	27.80	-.338	.305	-.549	235.16	.008	.144	.119	.344	0.000	0.000
1400	3	185.98	88.16	65.57	20.87	-.378	-.001	-.101	194.40	-.002	.145	.115	.345	0.000	0.000
1430	1	201.83	84.40	43.32	22.34	-.194	.200	.020	206.01	.006	.142	.298	.218	0.000	0.000
1430	2	225.35	98.70	53.94	32.61	-.355	-.569	-.124	233.27	.005	.186	.328	.231	0.000	0.000
1430	3	180.83	100.05	52.49	23.88	-.540	.039	-.051	185.24	.001	.166	.263	.295	0.000	0.000
1600	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1600	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1600	3	164.33	85.65	39.55	16.99	-.445	.111	-.053	158.48	.032	.193		.284	.244	0.000
1630	1	281.82	67.48	71.95	28.72	-.474	1.109	.134	290.85	.004	.105	.145	.257	0.000	0.000
1630	2	351.02	75.15	84.90	33.07	-.750	.954	-.295	363.24	.015	.097	.149	.246	0.000	0.000
1630	3	284.20	69.80	70.00	29.16	-.640	.901	-.185	290.77	-.015	.106	.134	.251	0.000	0.000
1700	1	293.50	71.57	56.67	29.71	-.741	.266	.029	298.79	.005	.106	.030	.191	0.000	0.000
1700	2	381.97	62.31	65.64	33.97	-.662	.268	-.192	388.32	.014	.090	.027	.171	0.000	0.000
1700	3	294.28	63.62	56.44	29.84	-.662	-.322	-.060	298.59	-.014	.105	0.000	.189	0.000	0.000
1730	1	255.40	60.96	44.67	26.41	-.523	-.280	.044	259.27	.008	.106	-.060	.168	0.000	0.000
1730	2	353.93	66.98	46.80	30.30	-.571	-.406	-.082	357.35	.023	.086	-.062	.129	0.000	0.000
1730	3	275.93	68.53	42.98	27.98	-.584	.043	-.007	278.40	-.013	.103	-.065	.151	0.000	0.000
1800	1	227.09	61.31	33.95	23.20	-.396	.134	.013	229.47	.006	.103	-.043	.145	0.000	0.000
1800	2	318.68	57.89	37.36	26.36	-.391	.064	-.068	321.00	.023	.080	-.059	.110	0.000	0.000
1800	3	244.21	58.77	33.00	23.75	-.420	-.099	-.013	245.80	-.014	.098	-.068	.130	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS	....CAL/(CM2-MIN)....		CENTIGRADE		LATENT HEAT TRANS	....CAL/(CM2-MIN).....		PARTS PER THOUSAND		
50267															
2330	1	.1139	.0067	0.0000	.1472	-.0374	-.0297	6.	.3200	.1482	-.0380	-.0300	0	0	0
2330	2	.2390	.0093	0.0000	.0239	.0068	-.0204	7.	.2400	0.0000	0.0000	0.0000	0	0	0
2330	3	.1325	-.0280	0.0000	.2551	-.0534	-.0134	6.	.3770	0.0000	0.0000	0.0000	0	0	C
50367															
	1	.0893	.0026	0.0000	.0921	-.0140	-.0308	6.	.2920	.0940	-.0159	-.0310	0	0	0
	2	.2164	.0104	0.0000	.0462	-.0237	-.0262	7.	.2520	0.0000	0.0000	0.0000	0	0	0
	3	.1088	-.0236	0.0000	.0607	.0095	-.0248	6.	.2630	0.0000	0.0000	0.0000	0	0	0
1130	1	-.2460	-.0122	0.0000	-.0552	.2680	.0490	17.	.8980	0.0000	0.0000	0.0000	0	0	0
1130	2	-.2241	.0178	0.0000	-.8854	-.0508	.1557	17.	.5960	0.0000	0.0000	0.0000	0	0	0
1130	3	-.2852	-.0005	0.0000	.5758	-.0973	.1759	10.	.9120	0.0000	0.0000	0.0000	0	0	0
1230	1	.2231	-.0012	0.0000	-.9307	-.1370	.1442	19.	.7440	.4387	.2905	.4247	0	0	0
1230	2	.2500	-.0013	0.0000	.0274	.0804	.1198	19.	.4090	0.0000	0.0000	0.0000	0	0	0
1230	3	.2664	-.0289	0.0000	.1150	-.0066	.1323	20.	.6930	0.0000	0.0000	0.0000	0	0	0
1306	1	.3674	.0065	0.0000	-1.3098	-.0798	.1351	20.	.7560	-.5082	-.1683	.4590	0	0	0
1306	2	.3906	.0016	0.0000	-.3267	.0854	.1641	19.	.5680	0.0000	0.0000	0.0000	0	0	0
1306	3	.3567	-.0234	0.0000	-.1526	.0310	.1287	20.	.6670	0.0000	0.0000	0.0000	0	0	0
1330	1	.1464	-.0009	0.0000	-.0764	.1005	.1194	20.	.6860	.8999	.6748	.4573	0	0	0
1330	2	.1542	-.0046	0.0000	-.1007	.0565	.1161	19.	.4670	0.0000	0.0000	0.0000	0	0	0
1330	3	.1463	-.0240	0.0000	-.0509	.0043	.1290	20.	.6430	0.0000	0.0000	0.0000	0	0	0
1400	1	.1080	-.0005	0.0000	-.0925	.2609	.0282	19.	.5560	-.1617	-.3696	.2206	0	0	0
1400	2	.1194	.0024	0.0000	-.0130	.2679	.0251	19.	.3400	0.0000	0.0000	0.0000	0	0	0
1400	3	.1065	-.0175	0.0000	.1310	.2820	.0419	20.	.5490	0.0000	0.0000	0.0000	0	0	0
1430	1	.3039	.0037	0.0000	-.5066	-.0130	.0907	20.	.7520	.3888	-.0046	.4332	0	0	0
1430	2	.3338	.0039	0.0000	-.5038	.0478	.1057	20.	.5390	0.0000	0.0000	0.0000	0	0	0
1430	3	.2808	-.0163	0.0000	.1830	.0367	.1534	20.	.7220	0.0000	0.0000	0.0000	0	0	0
1600	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1600	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1600	3	.2611	-.0152	0.0000	-.2637	.0374	.0164	20.	.4340	0.0000	0.0000	0.0000	0	0	0
1630	1	.1574	-.0012	0.0000	.0453	.1630	-.0085	19.	.3120	-.6176	-.4324	.1592	0	0	0
1630	2	.1558	.0111	0.0000	.0207	.1526	-.0054	19.	.1980	0.0000	0.0000	0.0000	0	0	0
1630	3	.1434	-.0231	0.0000	.0511	.1097	-.0125	19.	.1890	0.0000	0.0000	0.0000	0	0	0
1700	1	.0329	-.0021	0.0000	.1231	.0679	-.0463	18.	.3440	-1.0475	-2.4223	.1512	0	0	0
1700	2	.0290	.0107	0.0000	.0172	.1106	-.0349	19.	.3150	0.0000	0.0000	0.0000	0	0	0
1700	3	-.0036	-.0215	0.0000	.1342	.0754	-.0435	19.	.3450	0.0000	0.0000	0.0000	0	0	0
1730	1	-.0645	.0019	0.0000	.3341	-.0280	-.0593	17.	.4910	1.2322	[illegible]	-.0327	C	0	0
1730	2	-.0659	.0195	0.0000	.2770	-.0231	-.0503	18.	.3670	0.0000	0.0000	0.0000	0	0	0
1730	3	-.0651	-.0207	0.0000	.4185	-.0001	-.0518	17.	.4920	0.0000	0.0000	0.0000	0	0	0
1800	1	-.0415	.0001	0.0000	.3312	.0158	-.0520	15.	.6450	-.1814	.0070	-.0316	0	0	0
1800	2	-.0593	.0205	0.0000	.3337	.0120	-.0405	16.	.4710	0.0000	0.0000	0.0000	0	0	0
1800	3	-.0704	-.0203	0.0000	.4858	-.0183	-.0537	16.	.6190	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
			WIND ST DEV ....CM/SEC..........			REYNOLDS STRESSES ......DYNES/CM2......									
50367															
1830	1	232.62	50.64	36.02	23.21	-.360	.044	.027	235.25	.004	.100	.018	.149	0.000	0.000
1830	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1830	3	242.39	50.86	35.01	23.62	-.373	-.010	-.053	244.40	-.014	.098	.001	.143	0.000	0.000
1900	1	222.40	46.10	36.66	23.01	-.353	.038	.009	225.29	.006	.105	-.080	.160	0.000	0.000
1900	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1900	3	234.48	47.78	35.82	23.10	-.362	-.414	-.036	236.40	-.010	.100	-.107	.151	0.000	0.000
2000	1	253.79	62.74	37.70	26.48	-.540	-.027	.032	256.50	.003	.108	-.131	.149	0.000	0.000
2000	2	345.42	63.38	42.68	29.66	-.507	-.134	-.039	348.14	.035	.083	.007	.121	0.000	0.000
2000	3	261.18	64.57	38.13	26.41	-.524	-.092	-.050	263.16	-.016	.103	-.089	.144	0.000	0.000
2035	1	297.65	70.41	44.96	30.39	-.757	.513	.049	300.87	.005	.108	-.225	.149	0.000	0.000
2035	2	386.5[illegible]	64.15	54.54	34.18	-.814	.891	-.107	390.81	.043	.088	-.122	.138	0.000	0.000
2035	3	325.3[illegible]	[illegible]	49.41	32.43	-.742	.165	-.037	327.47	-.011	.103	-.178	.150	0.000	0.000
2100	1	250.07	56.67	36.69	26.30	-.523	-.074	.055	252.65	.005	.111	-.210	.147	0.000	0.000
2100	2	330.57	55.28	41.87	29.34	-.486	-.235	.005	333.52	.048	.090	-.125	.125	0.000	0.000
2100	3	263.97	56.20	39.07	26.48	-.447	-.268	-.020	265.57	-.012	.103	-.176	.148	0.000	0.000
2130	1	267.07	70.02	40.02	27.10	-.527	-.451	.026	269.86	-.002	.106	-.227	.149	0.000	0.000
2130	2	349.27	74.02	45.18	31.75	-.603	-.447	-.019	352.63	.040	.092	-.122	.129	0.000	0.000
2130	3	277.79	68.75	44.87	28.85	-.531	-.746	-.014	279.83	-.011	.107	-.180	.160	0.000	0.000
2200	1	315.97	72.74	38.86	31.53	-.801	.070	-.026	318.15	0.000	.106	-.310	.123	0.000	0.000
2200	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
2200	3	329.33	72.21	45.65	32.84	-.749	-.013	-.069	329.65	-.007	.104	-.286	.139	0.000	0.000
2300	1	185.17	35.97	28.01	18.58	-.234	.056	.019	187.21	0.000	.102	-.086	.148	0.000	0.000
2300	2	271.94	37.25	29.53	21.38	-.283	.007	-.053	273.87	.030	.078	-.115	.109	0.000	0.000
2300	3	211.14	36.29	27.87	20.15	-.283	-.018	-.009	212.29	-.011	.098	-.136	.132	0.000	0.000
2330	1	180.54	35.17	25.69	18.81	-.228	-.019	.015	182.30	.004	.105	.146	.141	0.000	0.000
2330	2	252.43	32.40	26.40	19.64	-.259	-.052	.012	254.11	.023	.078	.116	.103	0.000	0.000
2330	3	185.39	36.31	24.90	17.78	-.217	-.135	-.005	186.64	-.021	.097	.053	.132	0.000	0.000
50467															
	1	185.82	43.57	23.70	19.23	-.230	.024	.004	187.15	.006	.105	.332	.125	0.000	0.000
	2	247.73	45.01	25.69	21.36	-.277	-.016	-.003	250.85	.015	.085	.331	.104	0.000	0.000
	3	175.79	39.72	23.36	18.46	-.203	-.159	-.009	175.76	-.019	.106	.297	.134	0.000	0.000
30	1	186.22	46.94	41.08	21.39	-.359	-.393	.040	190.88	.012	.121	-.042	.237	0.000	0.000
30	2	249.44	51.83	45.73	25.74	-.259	-.817	-.116	254.59	.031	.103	.156	.194	0.000	0.000
30	3	182.59	48.58	38.46	19.58	-.214	-.693	-.034	185.97	-.015	.116	-.115	.243	0.000	0.000
100	1	152.96	54.70	50.60	18.04	-.249	-.319	.005	160.96	.017	.117	-.031	.327	0.000	0.000
100	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
100	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1200	1	257.28	99.81	84.19	29.90	-.715	1.557	.185	269.68	.010	.140	.089	.324	0.000	0.000
1200	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1200	3	274.59	104.30	76.89	29.89	-.718	.514	-.152	281.37	-.020	.135	.254	.275	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	AIR TEMP ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER THOUSAND	F	G
50367															
1830	1	.0193	-.0006	0.0000	.1265	.0439	-.05[illegible]	13.	.6770	.1065	.0495	-.0514	0	0	0
1830	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1830	3	.0011	-.0204	0.0000	.0749	.0754	-.0479	14.	.5950	0.0000	0.0000	0.0000	0	0	0
1900	1	-.0804	0.0000	0.0000	.2081	.0281	-.0480	12.	.5100	.1689	.0365	-.0496	0	0	0
1900	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1900	3	-.1135	-.0165	0.0000	.2391	.0003	-.0442	12.	.5160	0.0000	0.0000	0.0000	0	0	0
2000	1	-.1321	-.0040	0.0000	.1764	-.0011	-.0405	10.	.3270	.0178	.0181	-.0367	0	0	0
2000	2	.0059	.0328	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2000	3	-.0910	-.0229	0.0000	.2006	.0036	-.0342	10.	.2600	0.0000	0.0000	0.0000	0	0	0
2035	1	-.2203	-.0028	0.0000	.2840	.0444	-.0459	9.	.3300	.5294	.1421	-.0408	0	0	0
2035	2	-.1188	.0391	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2035	3	-.1765	-.0183	0.0000	.2085	.0232	-.0382	10.	.2680	0.0000	0.0000	0.0000	0	0	0
2100	1	-.2122	-.0023	0.0000	.2113	-.0226	-.0394	9.	.3500	.1156	-.0027	-.0378	0	0	0
2100	2	-.1285	.0447	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2100	3	-.1797	-.0181	0.0000	.2021	-.0355	-.0307	9.	.3500	0.0000	0.0000	0.0000	0	0	0
2130	1	-.2343	-.0093	0.0000	.1521	-.0134	-.0366	8.	.2820	.0780	.0117	-.0355	0	0	0
2130	2	-.1273	.0371	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2130	3	-.1886	-.0173	0.0000	.1951	-.0121	-.0294	9.	.2490	0.0000	0.0000	0.0000	0	0	0
2200	1	-.3113	-.0073	0.0000	.2003	0.0000	-.0393	8.	.2720	.1330	.0153	-.0349	0	0	0
2200	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2200	3	-.2862	-.0138	0.0000	.2018	.0052	-.0340	9.	.1950	0.0000	0.0000	0.0000	0	0	0
2300	1	-.0854	-.0054	0.0000	.1032	.0061	-.0231	8.	.2970	.0670	.0046	-.0221	0	0	0
2300	2	-.1164	.0277	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2300	3	-.1373	-.0173	0.0000	.0851	-.0022	-.0207	8.	.1490	0.0000	0.0000	0.0000	0	0	0
2330	1	.1471	-.0015	0.0000	.0925	.0012	-.0212	8.	.2500	.0771	-.0044	-.0215	0	0	0
2330	2	.1162	.0202	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2330	3	.0511	-.0271	0.0000	.1047	-.0131	-.0194	8.	.2270	0.0000	0.0000	0.0000	0	0	0
50467															
	1	.3350	.0007	0.0000	.1149	-.0022	-.0200	7.	.2150	.0711	.0019	-.0210	0	0	0
	2	.3366	.0117	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
	3	.2920	-.0254	0.0000	.0973	-.0115	-.0154	8.	.2310	0.0000	0.0000	0.0000	0	0	0
30	1	-.0552	.0029	0.0000	.0888	.0306	-.0275	7.	.2580	.0911	.0039	-.0282	0	0	0
30	2	.1442	.0290	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
30	3	-.1375	-.0203	0.0000	.0917	.0401	-.0211	8.	.2100	0.0000	0.0000	0.0000	0	0	0
100	1	-.0440	.0106	0.0000	.2324	.1036	-.0568	7.	.2960	.1276	-.0835	-.0254	0	0	0
100	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
100	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1200	1	.1222	.0030	0.0000	-.1772	-.1143	.1783	18.	.8770	0.0000	0.0000	0.0000	0	0	0
1200	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1200	3	.2466	-.0272	0.0000	-.1789	.0660	.1477	20.	.7930	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC..........				......DYNES/CM2.......									
50467															
1230	1	271.62	109.46	70.80	30.13	-.807	1.072	.079	279.93	.020	.139	.222	.261	0.000	0.000
1230	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1230	3	281.22	118.17	64.18	30.84	-.484	1.276	-.110	284.87	-.025	.155	.309	.265	0.000	0.000
1330	1	260.99	117.02	85.67	25.86	-.497	2.385	.266	273.30	.009	.109	.235	.309	0.000	0.000
1330	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1330	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1400	1	289.12	97.53	73.62	32.07	-.803	.245	.105	297.77	.014	.120	.178	.252	0.000	0.000
1400	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1400	3	280.72	98.93	71.32	31.86	-.685	-.345	-.177	286.87	-.020	.127	.219	.260	0.000	0.000
1430	1	303.78	87.72	83.21	33.62	-.887	.097	.155	314.30	.014	.120	.106	.261	0.000	0.000
1430	2	380.95	102.22	104.49	41.21	-1.272	-4.375	-.093	396.51	.035	.117	.086	.270	0.000	0.000
1430	3	312.25	96.84	89.59	34.08	-.925	-.134	-.203	321.88	-.013	.119	.088	.280	0.000	0.000
1500	1	340.74	90.69	87.44	36.31	-1.018	.643	.203	351.08	.011	.112	.166	.244	0.000	0.000
1500	2	435.77	108.52	104.35	46.28	-1.546	-4.542	-.323	450.04	.025	.117	[illegible]	.243	0.000	0.000
1500	3	362.14	94.45	85.22	36.54	-1.016	.509	-.188	369.11	-.023	.107	.179	.234	0.000	0.000
1530	1	371.69	95.85	75.48	39.42	-1.252	.340	.087	379.03	.008	.111	-.038	.200	0.000	0.000
1530	2	486.15	103.48	66.68	41.44	-1.399	-2.759	.359	492.18	.035	.090	-.157	.145	0.000	0.000
1530	3	382.52	95.14	77.54	39.94	-1.281	.204	-.106	388.72	-.018	.110	-.002	.200	0.000	0.000
1600	1	419.19	101.68	76.52	42.88	-1.658	.859	.165	425.77	.003	.108	-.237	.178	0.000	0.000
1600	2	546.56	92.68	61.61	43.61	-1.242	-.649	.332	553.61	.036	.081	-.320	.111	0.000	0.000
1600	3	450.94	91.84	80.48	43.81	-1.417	-.397	-.081	454.81	-.011	.102	-.223	.176	0.000	0.000
1630	1	426.29	100.66	79.76	44.50	-1.529	1.109	.204	433.38	.003	.109	-.135	.183	0.000	0.000
1630	2	544.85	103.42	52.93	44.58	-1.581	-.950	.343	549.63	.037	.083	-.256	.095	0.000	0.000
1630	3	436.83	93.06	84.42	43.37	-1.403	.039	-.260	442.32	-.014	.103	-.158	.187	0.000	0.000
1700	1	444.67	105.99	68.05	44.81	-1.658	-.779	.145	449.59	.001	.107	-.249	.153	0.000	0.000
1700	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1700	3	478.94	101.87	76.16	46.76	-1.626	-1.378	-.071	481.75	-.010	.104	-.222	.158	0.000	0.000
1730	1	439.96	111.92	66.21	45.39	-1.735	.156	.115	444.56	.001	.043	-.280	.148	0.000	0.000
1730	2	580.67	105.30	60.50	46.11	-1.540	-2.357	.356	588.72	.037	.081	-.367	.103	0.000	0.000
1730	3	471.42	107.36	72.67	45.99	-1.521	-1.503	-.036	472.69	-.008	.102	-.279	.151	0.000	0.000
1800	1	398.85	99.63	54.93	40.26	-1.420	-.186	.151	402.29	0.000	.107	-.300	.136	0.000	0.000
1800	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1800	3	430.83	95.96	60.03	42.51	-1.364	-.953	-.056	430.87	-.007	.104	-.303	.140	0.000	0.000
1830	1	337.57	85.04	43.37	35.35	-1.046	-.266	.083	340.08	.001	.110	-.313	.127	0.000	0.000
1830	2	443.85	80.92	48.42	32.53	-.624	-2.024	.307	449.23	.035	.073	-.309	.107	0.000	0.000
1830	3	351.62	[illegible]	44.24	34.83	-.919	-.642	-.007	350.75	-.007	.104	-.324	.128	0.000	0.000
1900	1	275.16	66.77	42.51	29.38	-.717	-.519	.070	278.31	.005	.111	-.181	.155	0.000	0.000
1900	2	382.96	67.78	38.78	30.89	-.715	-2.057	.258	385.96	.034	.080	-.192	.102	0.000	0.000
1900	3	285.83	67.99	44.17	29.51	-.647	-.585	-.017	287.79	-.010	.107	-.168	.152	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER THOUSAND		
50467															
1230	1	.2403	.0072	0.0000	-.5444	-.0557	.1787	19.	.8670	0.0000	0.0000	0.0000	0	0	0
1230	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1230	3	.3258	-.0304	0.0000	-.0568	-.0091	.1527	20.	.7770	0.0000	0.0000	0.0000	0	0	0
1330	1	.2675	.0025	0.0000	-1.2067	-.2024	.1622	19.	.7350	0.0000	0.0000	0.0000	0	0	0
1330	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1330	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1400	1	.1829	.0049	0.0000	-.2863	.0315	.1122	19.	.6700	0.0000	0.0000	0.0000	0	0	0
1400	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1400	3	.2107	-.0287	0.0000	-.1149	.0680	.1132	20.	.6730	0.0000	0.0000	0.0000	0	0	0
1430	1	.1042	.0045	0.0000	-.2127	.0383	.1079	19.	.5220	0.0000	0.0000	0.0000	0	0	0
1430	2	.0566	.0277	0.0000	-.2209	.1027	.1091	19.	.4840	0.0000	0.0000	0.0000	0	0	0
1430	3	.0872	-.0238	0.0000	-.1083	.1000	.1043	21.	.5130	0.0000	0.0000	0.0000	0	0	0
1500	1	.1694	.0033	0.0000	-.2491	-.0070	.0876	19.	.4170	0.0000	0.0000	0.0000	0	0	0
1500	2	.0521	.0184	0.0000	-.2052	.0586	.1144	19.	.3340	0.0000	0.0000	0.0000	0	0	0
1500	3	.1725	-.0314	0.0000	-.2661	-.0432	.0800	20.	.3960	0.0000	0.0000	0.0000	0	0	0
1530	1	-.0377	.0004	0.0000	-.2741	.0125	.0605	19.	.3410	0.0000	0.0000	0.0000	0	0	0
1530	2	-.1704	.0305	0.0000	-.2871	.1178	.0835	19.	.3180	0.0000	0.0000	0.0000	0	0	0
1530	3	-.0001	-.0265	0.0000	-.2342	.0058	.0597	20.	.2900	0.0000	0.0000	0.0000	0	0	0
1600	1	-.2337	-.0049	0.0000	-.1887	.0156	.0471	18.	.2440	0.0000	0.0000	0.0000	0	0	0
1600	2	-.3264	.0325	0.0000	-.1384	.0357	.0404	18.	.2970	0.0000	0.0000	0.0000	0	0	0
1600	3	-.2242	-.0185	0.0000	-.1300	-.0061	.0354	19.	.3270	0.0000	0.0000	0.0000	0	0	0
1630	1	-.1306	-.0043	0.0000	-.1565	-.0216	.0234	17.	.2420	0.0000	0.0000	0.0000	0	0	0
1630	2	-.2624	.0332	0.0000	-.1765	.0114	.0185	18.	.2810	0.0000	0.0000	0.0000	0	0	0
1630	3	-.1573	-.0214	0.0000	-.0891	-.0422	.0208	19.	.2050	0.0000	0.0000	0.0000	0	0	0
1700	1	-.2540	-.0066	0.0000	-.1844	.0481	-.0061	16.	.3820	0.0000	0.0000	0.0000	0	0	0
1700	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1700	3	-.2262	-.0176	0.0000	-.1391	.0360	-.0070	18.	.4360	0.0000	0.0000	0.0000	0	0	0
1730	1	-.2807	-.0064	0.0000	.1461	-.0125	-.0364	15.	.3600	0.0000	0.0000	0.0000	0	0	0
1730	2	-.3783	.0340	0.0000	.0322	-.0408	-.0345	16.	.3640	0.0000	0.0000	0.0000	0	0	0
1730	3	-.2833	-.0146	0.0000	.1524	-.0597	-.0292	16.	.4130	0.0000	0.0000	0.0000	0	0	0
1800	1	-.3030	-.0075	0.0000	.3176	-.0107	-.0616	14.	.4470	0.0000	0.0000	0.0000	0	0	0
1800	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1800	3	-.3060	-.0140	0.0000	.3548	-.0108	-.0493	15.	.4460	0.0000	0.0000	0.0000	0	0	0
1830	1	-.3171	-.0068	0.0000	.4818	-.0452	-.0572	12.	.4680	0.0000	0.0000	0.0000	0	0	0
1830	2	-.3217	.0330	0.0000	.3470	-.1275	-.0388	13.	.3820	0.0000	0.0000	0.0000	0	0	0
1830	3	-.3277	-.0141	0.0000	.3806	-.0664	-.0452	14.	.4720	0.0000	0.0000	0.0000	0	0	0
1900	1	-.1886	-.0025	0.0000	.2890	-.0213	-.0553	11.	.4440	0.0000	0.0000	0.0000	0	0	0
1900	2	-.2062	.0304	0.0000	.1695	-.0529	-.0506	12.	.3790	0.0000	0.0000	0.0000	0	0	0
1900	3	-.1734	-.0180	0.0000	.2298	-.0058	-.0440	12.	.4120	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		....	WIND ST DEV	........CM/SEC........		REYNOLDS STRESSES	......DYNES/CM2......								
50467															
1930	1	278.77	71.03	48.72	28.97	-.625	-.991	.111	282.81	-.002	.107	-.186	.174	0.000	0.000
1930	2	373.40	65.37	44.57	31.06	-.522	-2.286	.217	377.04	.039	.082	-.186	.120	0.000	0.000
1930	3	294.41	68.59	46.41	30.45	-.597	-.837	.006	295.36	-.012	.106	-.191	.158	0.000	0.000
2000	1	292.97	71.25	43.76	31.21	-.727	-.696	.078	296.05	0.000	.111	-.232	.149	0.000	0.000
2000	2	398.31	72.16	40.62	33.23	-.751	-2.050	.275	401.76	.040	.082	-.227	.103	0.000	0.000
2000	3	291.21	62.38	43.65	30.29	-.628	-.172	-.014	292.42	-.010	.107	-.240	.149	0.000	0.000
2030	1	335.65	78.57	47.21	34.97	-1.028	-.735	.086	338.74	0.000	.110	-.291	.141	0.000	0.000
2030	2	444.08	78.42	48.88	34.99	-.903	-2.042	.336	449.32	.037	.079	-.295	.109	0.000	0.000
2030	3	345.56	75.79	49.71	34.99	-.871	-.657	-.038	346.11	-.008	.106	-.282	.144	0.000	0.000
50567															
735	1	231.23	60.86	48.49	25.20	-.537	-.731	.099	236.36	-.004	.119	-.169	.221	0.000	0.000
735	2	288.51	62.72	49.66	28.86	-.264	-.675	.039	294.10	.016	.106	-.186	.178	0.000	0.000
735	3	235.93	59.49	62.03	25.80	-.577	-.314	-.166	242.48	-.003	.117	.003	.260	0.000	0.000
800	1	196.85	64.81	60.32	23.10	-.469	-.879	.098	205.54	.004	.131	-.167	.304	0.000	0.000
800	2	238.85	53.97	55.23	29.50	-.139	-1.594	-.214	249.28	.034	.131	-.165	.274	0.000	0.000
800	3	215.24	68.93	65.66	25.25	-.419	-.731	-.125	222.92	-.008	.131	.079	.298	0.000	0.000
830	1	248.65	115.80	90.72	28.08	-.413	6.691	.183	264.78	0.000	.122	.062	.382	0.000	0.000
830	2	301.98	134.01	107.60	35.89	-.959	9.100	-.648	322.44	.019	.131	.066	.346	0.000	0.000
830	3	236.69	112.41	77.03	28.27	-.673	-.354	-.328	246.41	-.010	.134	.032	.337	0.000	0.000
900	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
900	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
900	3	355.22	78.60	79.27	37.04	-.960	.281	-.035	361.70	-.020	.109	.129	.218	0.000	0.000
930	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
930	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
930	3	392.99	87.44	77.57	39.84	-1.154	.119	-.154	398.43	-.020	.106	.124	.192	0.000	0.000
1000	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1000	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1000	3	424.69	91.90	74.15	42.21	-1.487	.914	-.083	427.30	-.022	.107	.261	.173	0.000	0.000
1030	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1030	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1030	3	429.63	98.38	90.35	44.16	-1.560	1.166	-.155	435.50	-.018	.109	.219	.210	0.000	0.000
1100	1	386.59	106.08	87.68	41.03	-1.446	.901	.166	396.04	.004	.111	-.097	.223	0.000	0.000
1100	2	500.71	119.56	99.80	43.98	-1.269	2.148	-.388	511.66	.019	.092	-.085	.195	0.000	0.000
1100	3	397.34	110.74	50.16	40.82	-1.200	.342	-.327	404.93	-.013	.108	-.115	.222	0.000	0.000
1130	1	349.75	93.94	104.02	37.99	-1.054	3.055	.186	364.54	.003	.113	-.068	.291	0.000	0.000
1130	2	447.89	101.08	122.22	42.69	-1.285	5.080	-.483	466.32	.023	.095	-.080	.267	0.000	0.000
1130	3	366.00	206.05	249.30	0.00	-1.538	383.740	-.527	2.39	-.013	.111	-.102	.267	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER THOUSAND	F	G
50467															
1930	1	-.1969	-.0097	0.0000	.2861	-.0279	-.0456	11.	.3450	0.0000	0.0000	0.0000	0	0	0
1930	2	-.2028	.0367	0.0000	.1371	-.0573	-.0400	11.	.2230	0.0000	0.0000	0.0000	0	0	0
1930	3	-.1988	-.0182	0.0000	.2653	-.0230	-.0405	12.	.3460	0.0000	0.0000	0.0000	0	0	0
2000	1	-.2473	-.0083	0.0000	.3276	-.0666	-.0525	10.	.3590	0.0000	0.0000	0.0000	0	0	0
2000	2	-.2413	.0370	0.0000	.2676	-.1193	-.0541	11.	.3370	0.0000	0.0000	0.0000	0	0	0
2000	3	-.2410	-.0167	0.0000	.2601	-.0370	-.0403	11.	.2640	0.0000	0.0000	0.0000	0	0	0
2030	1	-.2985	-.0080	0.0000	.2233	-.0017	-.0514	10.	.2520	0.0000	0.0000	0.0000	0	0	0
2030	2	-.3082	.0338	0.0000	.1873	-.0373	-.0520	10.	.2470	0.0000	0.0000	0.0000	0	0	0
2030	3	-.2858	-.0156	0.0000	.2260	.0217	-.0453	11.	.2750	0.0000	0.0000	0.0000	0	0	0
50567															
735	1	-.1823	-.0146	0.0000	-.3127	.1267	.1257	13.	1.4560	0.0000	0.0000	0.0000	0	0	0
735	2	-.1960	.0140	0.0000	-.0161	-.0823	.0743	13.	1.3680	0.0000	0.0000	0.0000	0	0	0
735	3	-.0023	-.0133	0.0000	-.2882	-.1233	.1171	14.	.5900	0.0000	0.0000	0.0000	0	0	0
800	1	-.1810	-.0070	0.0000	-.0935	-.0254	.0902	13.	.5680	0.0000	0.0000	0.0000	0	0	0
800	2	-.1881	.0345	0.0000	-.0141	-.0213	.0961	13.	.3850	0.0000	0.0000	0.0000	0	0	0
800	3	.0647	-.0175	0.0000	-.2021	.0121	.1075	14.	.5490	0.0000	0.0000	0.0000	0	0	0
830	1	.1536	-.0047	0.0000	.1240	.1181	.0419	13.	.2610	0.0000	0.0000	0.0000	0	0	0
830	2	.1501	.0100	0.0000	.2042	.1315	.0354	13.	.2500	0.0000	0.0000	0.0000	0	0	0
830	3	.0138	-.0201	0.0000	-.2161	-.0899	.0437	14.	.3060	0.0000	0.0000	0.0000	0	0	0
900	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
900	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
900	3	.1284	-.0281	0.0000	-.1860	.0334	.0576	14.	.2200	0.0000	0.0000	0.0000	0	0	0
930	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
930	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
930	3	.1243	-.0273	0.0000	-.2621	.0637	.0504	15.	.2890	0.0000	0.0000	0.0000	0	0	0
1000	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1000	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1000	3	.2637	-.0303	0.0000	-.3216	.0282	.1049	15.	.3920	0.0000	0.0000	0.0000	0	0	0
1030	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1030	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1030	3	.2222	-.0265	0.0000	-.5607	.0493	.1576	16.	.6070	0.0000	0.0000	0.0000	0	0	0
1100	1	-.0925	-.0040	0.0000	-.3158	.0145	.1134	14.	.4260	0.0000	0.0000	0.0000	0	0	0
1100	2	-.0787	.0153	0.0000	-.2389	-.0462	.1068	14.	.3820	0.0000	0.0000	0.0000	0	0	0
1100	3	-.1121	-.0212	0.0000	-.3587	-.0200	.1003	16.	.4340	0.0000	0.0000	0.0000	0	0	0
1130	1	-.0438	-.0049	0.0000	-.2301	.1061	.1036	14.	.4770	0.0000	0.0000	0.0000	0	0	0
1130	2	-.0575	.0188	0.0000	-.1140	.0875	.1035	14.	.3340	0.0000	0.0000	0.0000	0	0	0
1130	3	-.0036	0.0000	0.0000	-.2673	.0857	.1069	16.	.4610	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	PUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
			WIND ST DEV			REYNOLDS STRESSES									
		.........CM/SEC...........				......DYNES/CM2.......									
42267															
923	1	199.81	66.72	52.69	24.01	-.376	.030	0.000	206.22	.008	.135	-.255	.257	0.000	0.000
923	2	200.51	66.20	51.66	23.55	-.414	-.064	0.000	206.32	.054	.133	-.231	.251	0.000	0.000
923	3	203.50	64.87	51.39	23.34	-.372	.053	0.000	207.41	-.004	.131	-.261	.246	0.000	0.000
953	1	230.16	67.17	65.04	25.94	-.507	.184	0.000	233.70	.005	.121	-.174	.271	0.000	0.000
953	2	230.36	68.18	63.82	26.06	-.529	.083	0.000	236.14	.048	.121	-.173	.260	0.000	0.000
953	3	233.65	66.75	63.51	25.84	-.412	.300	0.000	240.00	-.002	.118	-.181	.262	0.000	0.000
1108	1	315.74	95.37	69.26	33.55	-1.138	-1.146	0.000	322.72	.004	.118	-.335	.208	0.000	0.000
1108	2	324.42	92.90	64.69	32.43	-1.037	-1.206	0.000	329.35	.049	.107	-.328	.187	0.000	0.000
1108	3	328.14	88.09	64.28	32.87	-.926	-.466	0.000	330.27	-.015	.109	-.321	.190	0.000	0.000
1158	1	345.28	88.87	93.68	37.35	-.995	.126	0.000	355.46	.007	.113	-.009	.266	0.000	0.000
1158	2	342.61	89.76	94.38	38.42	-1.136	.185	0.000	354.45	-.012	.118	.010	.270	0.000	0.000
1158	3	349.24	89.60	93.12	38.41	-1.174	.717	0.000	359.30	.021	.116	0.000	.264	0.000	0.000
1230	1	365.86	98.33	108.22	39.83	-1.379	-.563	0.000	380.97	.012	.115	-.025	.284	0.000	0.000
1230	2	365.11	94.48	109.73	40.96	-1.298	-.738	0.000	380.53	-.007	.117	-.006	.289	0.000	0.000
1230	3	373.02	92.47	107.23	41.07	-1.252	-1.093	0.000	385.04	.023	.114	-.027	.278	0.000	0.000
1300	1	352.34	97.35	85.55	37.03	-1.072	-1.406	0.000	362.79	.005	.111	-.102	.250	0.000	0.000
1300	2	351.49	98.43	86.66	36.91	-1.151	-1.240	0.000	362.03	-.007	.113	-.084	.253	0.000	0.000
1300	3	355.25	98.16	86.53	38.58	-1.127	-1.550	0.000	363.65	.016	.115	-.093	.245	0.000	0.000
1411	1	382.65	89.78	84.68	38.81	-1.224	-.518	0.000	391.16	.063	.105	-.246	.221	0.000	0.000
1411	2	379.32	88.74	84.10	39.88	-1.325	-.555	0.000	388.31	.006	.110	-.246	.219	0.000	0.000
1411	3	384.92	92.41	80.99	39.37	-1.335	-.213	0.000	389.39	-.056	.110	-.231	.212	0.000	0.000
1441	1	350.86	84.51	66.96	36.27	-1.072	-.389	0.000	356.52	.065	.110	-.281	.192	0.000	0.000
1441	2	349.29	82.86	65.58	36.94	-1.065	-.139	0.000	355.16	.005	.110	-.280	.188	0.000	0.000
1441	3	354.37	82.60	65.28	36.71	-1.038	-.065	0.000	356.75	-.062	.109	-.261	.187	0.000	0.000
1515	1	347.05	79.51	60.84	36.25	-.998	-.640	0.000	351.62	.067	.110	-.248	.176	0.000	0.000
1515	2	344.56	77.77	60.22	36.43	-.995	-.368	0.000	349.57	.005	.110	-.252	.174	0.000	0.000
1515	3	347.03	78.87	59.13	36.56	-1.126	-.485	0.000	346.85	0.000	0.000	-.240	.173	0.000	0.000
1611	1	326.07	82.87	63.89	34.24	-1.067	1.182	0.000	331.49	.070	.112	-.223	.195	0.000	0.000
1611	2	323.11	79.95	63.65	34.66	-1.000	.615	0.000	328.97	.002	.113	-.184	.192	0.000	0.000
1611	3	325.62	80.40	62.56	34.34	-1.040	.210	0.000	328.93	-.056	.113	-.176	.190	0.000	0.000
1640	1	373.39	99.70	23.64	33.29	-1.134	.243	0.000	373.74	-.037	.096	-.544	.079	0.000	0.000
1640	2	393.35	103.37	23.20	32.24	-1.182	-.205	0.000	393.16	.057	.086	-.482	.071	0.000	0.000
1640	3	393.02	97.26	26.06	34.06	-1.112	.628	0.000	387.02	.018	.098	-.474	.080	0.000	0.000
1723	1	291.31	79.46	81.39	32.18	-.783	-2.330	0.000	300.83	-.055	.114	-.131	.256	0.000	0.000
1723	2	294.77	78.78	81.78	32.28	-.766	-2.560	0.000	304.35	.058	.111	-.133	.253	0.000	0.000
1723	3	302.09	81.01	81.71	31.76	-.767	-2.824	0.000	309.41	.053	.109	-.122	.248	0.000	0.000
1753	1	204.21	73.11	42.57	23.16	-.487	-1.419	0.000	206.54	-.035	.116	-.272	.231	0.000	0.000
1753	2	208.62	72.51	42.38	23.31	-.408	-1.639	0.000	212.77	.064	.112	-.257	.223	0.000	0.000
1753	3	216.39	75.14	43.49	22.65	-.383	-1.653	0.000	218.81	.039	.108	-.260	.227	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER THOUSAND		
42267															
923	1	-.2522	-.0036	.0210	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
923	2	-.2327	.0449	-.0380	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
923	3	-.2523	-.0160	.0460	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
953	1	-.1687	-.0051	.0150	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
953	2	-.1702	.0397	-.0350	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
953	3	-.1704	-.0102	.0420	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1108	1	-.3404	-.0060	.0150	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1108	2	-.3340	.0418	-.0220	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1108	3	-.3185	-.0232	.0580	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1158	1	-.0091	-.0001	.0200	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1158	2	.0098	-.0217	-.0500	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1158	3	.0047	.0135	.0510	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1230	1	-.0272	.0036	.0200	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1230	2	-.0109	-.0163	-.0540	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1230	3	-.0309	.0152	.0640	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1300	1	-.1107	-.0033	.0310	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1300	2	-.0914	-.0162	-.0610	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1300	3	-.0995	.0081	.0750	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1411	1	-.2480	.0578	.0600	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1411	2	-.2488	-.0016	-.0500	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1411	3	-.2300	-.0654	.0420	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1441	1	-.2820	.0586	.0890	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1441	2	-.2803	-.0026	-.0630	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1441	3	-.2583	-.0698	.0310	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1515	1	-.2520	.0606	.0890	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1515	2	-.2545	-.0020	-.0580	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1515	3	-.2403	-.0627	.0600	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1611	1	-.2115	.0625	.0110	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1611	2	-.1797	-.0066	-.0570	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1611	3	-.1723	-.0653	.0430	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1640	1	-.5448	-.0452	.1800	.0877	.0026	-.0233	12.	.1890	0.0000	0.0000	0.0000	0	0	0
1640	2	-.4876	.0512	-.1700	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1640	3	-.4654	.0118	-.0520	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1723	1	-.1471	-.0657	.0030	.0652	.0950	-.0219	11.	.1730	0.0000	0.0000	0.0000	0	0	0
1723	2	-.1506	.0527	.0010	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1723	3	-.1382	.0449	.1070	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1753	1	-.2940	-.0655	-.0190	.2370	-.1039	-.0225	11.	.2380	0.0000	0.0000	0.0000	0	0	0
1753	2	-.2933	.0569	.0490	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1753	3	-.2818	.0295	.1320	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0

023

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND	F ELEV	FSD ANGLE	G AZIM	GSD ANGLE	WIND DIR	WIND SHIFT
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC..........				......DYNES/CM2.......			CM/SEC	RAD	RAD	RAD	RAD	RAD	RAD
42267															
1830	1	132.68	19.21	28.90	8.22	-.036	-.276	0.000	135.48	-.054	.059	.217	.209	0.000	0.000
1830	2	130.45	24.04	30.18	8.83	-.045	-.501	0.000	133.74	.038	.065	.278	.230	0.000	0.000
1830	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1900	1	164.76	46.74	33.66	15.79	-.167	-.330	0.000	167.72	-.057	.088	.097	.202	0.000	0.000
1900	2	166.58	46.98	33.93	16.05	-.164	-.406	0.000	169.72	.049	.090	.143	.204	0.000	0.000
1900	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1930	1	180.91	42.51	28.23	18.17	-.218	-.342	0.000	182.61	-.059	.099	-.051	.150	0.000	0.000
1930	2	183.69	41.84	28.64	18.23	-.196	-.374	0.000	185.52	.055	.097	-.008	.149	0.000	0.000
1930	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
2000	1	190.10	40.30	34.65	20.77	-.272	-.485	0.000	192.75	-.060	.109	-.163	.180	0.000	0.000
2000	2	193.84	41.14	37.30	20.27	-.258	-.598	0.000	196.89	.062	.104	-.125	.186	0.000	0.000
2000	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
2030	1	183.16	51.64	38.84	20.76	-.283	-.521	0.000	187.11	-.054	.135	-.247	.237	0.000	0.000
2030	2	191.61	41.24	40.51	20.76	-.289	-.572	0.000	195.76	.064	.109	-.215	.226	0.000	0.000
2030	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
42567															
900	1	254.72	66.00	59.35	28.73	-.657	-.383	0.000	261.59	.003	.121	-.273	.235	0.000	0.000
900	2	253.28	63.81	64.75	30.26	-.730	-.503	0.000	261.22	.004	.125	-.158	.251	0.000	0.000
900	3	264.59	66.89	59.29	28.71	-.690	-.723	0.000	265.51	-.008	.119	-.227	.232	0.000	0.000
945	1	267.36	75.54	76.92	30.96	-.724	-.029	0.000	277.90	.003	.123	-.230	.282	0.000	0.000
945	2	266.58	72.64	82.67	31.18	-.728	.016	0.000	278.47	-.001	.121	-.114	.298	0.000	0.000
945	3	275.35	74.55	74.99	31.74	-.767	-.538	0.000	278.77	0.000	.126	-.188	.272	0.000	0.000
1015	1	312.69	92.87	81.11	31.94	-1.008	-2.208	0.000	322.84	.012	.112	-.301	.257	0.000	0.000
1015	2	316.66	87.30	91.26	32.92	-.843	-2.731	0.000	329.01	.005	.109	-.206	.279	0.000	0.000
1015	3	392.64	66.71	83.58	28.63	-.427	-1.298	0.000	394.64	-.010	.086	-.192	.225	0.000	0.000
1614	1	451.68	91.73	[illegible]	40.62	-1.290	.268	0.000	456.20	.018	.094	.186	.142	0.000	0.000
1614	2	450.51	94.18	78.96	41.55	-1.539	.508	0.000	456.97	-.015	.097	.229	.172	0.000	0.000
1614	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1713	1	230.62	43.39	31.33	21.04	-.269	-.184	0.000	232.65	.015	.092	.154	.133	0.000	0.000
1713	2	229.56	43.23	35.91	21.10	-.297	-.372	0.000	232.22	-.015	.093	.170	.155	0.000	0.000
1713	3	237.46	42.12	35.10	20.18	-.210	-.321	0.000	237.59	-.007	.086	.166	.147	0.000	0.000
42667															
1330	1	196.33	116.64	53.23	24.03	-.620	1.241	0.000	202.81	.036	.215	.223	.316	0.000	0.000
1330	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1330	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1400	1	207.66	104.52	79.33	25.04	-.425	-.066	0.000	220.59	.020	.175	.003	.360	0.000	0.000
1400	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1400	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1630	1	399.60	94.17	67.46	39.41	-1.260	-.524	0.000	404.96	.003	.103	-.203	.162	0.000	0.000
1630	2	[illegible]	98.11	77.87	47.99	-1.284	-1.786	0.000	524.86	.097	.093	-.207	.145	0.000	0.000
1630	3	425.92	103.42	66.56	43.27	-1.451	-.537	0.000	422.20	-.007	.112	-.275	.165	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER THOUSAND		
42267															
1830	1	.2049	-.0580	.0520	.0234	.0025	-.0052	9.	.1790	0.0000	0.0000	0.0000	0	0	0
1830	2	.2526	.0390	-.0480	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1830	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1900	1	.0868	-.0629	.0360	.1799	-.0363	-.0168	9.	.3190	0.0000	0.0000	0.0000	0	0	0
1900	2	.1306	.0467	-.0310	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1900	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1930	1	-.0595	-.0654	.0220	.1192	-.0122	-.0138	9.	.1940	0.0000	0.0000	0.0000	0	0	0
1930	2	-.0169	.0519	-.0040	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1930	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2000	1	-.1743	-.0670	-.0070	.1130	-.0677	-.0173	9.	.2460	0.0000	0.0000	0.0000	0	0	0
2000	2	-.1379	.0584	-.0335	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2000	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2030	1	-.2637	-.0642	.0140	-.0017	.0251	-.0145	10.	.1890	0.0000	0.0000	0.0000	0	0	0
2030	2	-.2260	.0591	-.0160	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2030	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
42567															
900	1	-.2745	-.0059	.0380	-.1606	-.0146	.0885	10.	.4480	0.0000	0.0000	0.0000	0	0	0
900	2	-.1608	-.0063	-.0330	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
900	3	-.2255	-.0182	.0640	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
945	1	-.2291	-.0056	.0410	-.0769	.0967	.1453	11.	.8400	0.0000	0.0000	0.0000	0	0	0
945	2	-.1159	-.0115	-.0300	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
945	3	-.1889	-.0095	.1020	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1015	1	-.3156	.0022	.0540	-.5127	-.0124	.2226	13.	.8570	0.0000	0.0000	0.0000	0	0	0
1015	2	-.2256	-.0021	-.0260	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1015	3	-.1949	-.0144	.1100	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1614	1	.1883	.0129	.0640	-.2549	.1268	.0687	14.	.5140	0.0000	0.0000	0.0000	0	0	0
1614	2	.2310	-.0232	-.0330	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1614	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1713	1	.1532	.0110	.0600	.2458	-.0423	-.0358	10.	.5720	0.0000	0.0000	0.0000	0	0	0
1713	2	.1655	-.0200	-.0220	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1713	3	.1604	-.0106	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
42667															
1330	1	.2894	.0191	0.0000	.0962	-.1262	.1324	15.	1.0100	.4048	-.0619	.3524	0	0	0
1330	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1330	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1400	1	-.0027	.0075	.0260	-.0868	-.0306	.1309	15.	.5470	.3419	-.3974	.3597	0	0	0
1400	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1400	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1630	1	-.2068	-.3041	.0150	.0231	.0311	-.0185	13.	.3100	-.3334	.0139	.0552	0	0	0
1630	2	-.2139	.0942	-.0020	.0040	-.0012	-.0166	13.	.1680	0.0000	0.0000	0.0000	0	0	0
1630	3	-.2726	-.0153	-.0240	.0803	-.0340	-.0259	10.	.2270	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		....	WIND ST DEV	........CM/SEC........		......REYNOLDS STRESSES	DYNES/CM2......		CM/SEC						
42667															
1700	1	394.20	90.33	61.37	38.24	-1.197	-.052	0.000	398.76	.005	.100	-.169	.151	0.000	0.000
1700	2	512.94	92.34	69.67	46.16	-1.274	-.658	0.000	515.71	.086	.092	-.174	.134	0.000	0.000
1700	3	425.03	104.19	63.97	42.98	-1.407	-.357	0.000	422.77	-.007	.112	-.236	.157	0.000	0.000
1730	1	414.43	92.79	54.94	37.93	-1.329	.442	0.000	417.82	-.003	.096	-.354	.128	0.000	0.000
1730	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1730	3	432.53	100.55	48.36	42.82	-1.160	1.078	0.000	419.10	-.001	.108	-.419	.117	0.000	0.000
1800	1	377.75	82.02	46.09	34.55	-.974	.083	0.000	380.37	-.002	.096	-.369	.119	0.000	0.000
1800	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1800	3	405.39	100.10	67.56	43.75	-.535	2.211	0.000	391.38	.001	.115	-.447	.116	0.000	0.000
1900	1	271.67	62.02	37.61	27.10	-.642	-.262	0.000	274.17	.004	.106	-.276	.138	0.000	0.000
1900	2	362.88	61.57	61.35	35.19	-.646	1.585	0.000	364.41	.140	.100	-.322	.165	0.000	0.000
1900	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1930	1	256.91	57.17	35.77	24.58	-.457	-.258	0.000	259.25	-.001	.098	-.272	.136	0.000	0.000
1930	2	339.07	53.52	60.69	30.84	-.328	1.542	0.000	341.11	.138	.093	-.315	.176	0.000	0.000
1930	3	226.94	59.78	55.62	31.88	-.725	.098	0.000	230.78	-.004	.176	-.034	.265	0.000	0.000
2000	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
2000	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
2000	3	205.77	73.29	41.32	29.79	-.292	1.025	0.000	200.78	.009	.208	-.447	.235	0.000	0.000
42767															
930	1	448.69	124.90	104.97	45.23	-1.984	.833	0.000	460.29	0.000	.108	-.218	.227	0.000	0.000
930	2	564.70	120.39	131.94	54.04	-1.570	1.511	0.000	579.86	.040	.099	-.066	.238	0.000	0.000
930	3	479.21	128.44	98.94	48.40	-1.639	-.408	0.000	482.00	-.004	.106	-.169	.207	0.000	0.000
1000	1	420.42	107.86	111.78	43.91	-1.602	-2.658	0.000	434.64	.001	.109	-.114	.258	0.000	0.000
1000	2	535.34	120.79	135.04	51.87	-1.974	-4.326	0.000	551.39	.040	.100	.014	.247	0.000	0.000
1000	3	455.61	121.34	112.13	45.89	-1.714	-3.367	0.000	462.20	-.005	.108	-.087	.243	0.000	0.000
1030	1	422.00	119.38	109.20	42.50	-1.551	-1.533	0.000	435.79	0.000	.105	-.168	.258	0.000	0.000
1030	2	534.32	147.77	126.56	46.48	-2.154	2.058	0.000	548.77	.042	.094	-.063	.240	0.000	0.000
1030	3	451.30	115.04	95.05	44.94	-1.423	.039	0.000	423.07	-.001	.105	-.200	.214	0.000	0.000
1100	1	405.70	119.85	121.79	42.04	-1.566	-1.892	0.000	423.09	.003	.107	-.032	.293	0.000	0.000
1100	2	498.94	139.06	136.47	49.79	-2.029	.994	0.000	516.77	.040	.108	.107	.274	0.000	0.000
1100	3	424.64	115.91	120.90	42.54	-1.341	-1.645	0.000	433.71	-.009	.104	-.033	.278	0.000	0.000
1130	1	412.00	114.36	85.26	39.46	-1.289	1.813	0.000	420.78	.004	.102	.254	.214	0.000	0.000
1130	2	501.54	142.03	84.04	41.82	-1.091	1.680	0.000	507.90	.009	.090	.381	.175	0.000	0.000
1130	3	426.16	127.97	93.43	40.22	-1.250	1.004	0.000	424.95	-.018	.105	.283	.232	0.000	0.000
1200	1	473.71	120.97	66.76	40.02	-1.389	.891	0.000	477.94	.009	.091	.394	.134	0.000	0.000
1200	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1200	3	494.01	129.31	78.80	42.59	-1.383	-.059	0.000	484.23	-.019	.097	.370	.173	0.000	0.000
1400	1	515.13	124.89	128.72	51.79	-2.214	-3.517	0.000	529.74	.003	.105	-.003	.230	[illegible]00	0.000
1400	2	675.53	131.51	152.45	56.67	-2.398	-2.264	0.000	691.18	.037	.089	.046	.214	0.000	0.000
1400	3	542.87	128.24	122.09	55.20	-2.226	-1.584	0.000	550.13	-.008	.106	-.015	.217	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	AIR TEMP ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER THOUSAND	F	G
42667															
1700	1	-.1697	-.0018	.0550	.2009	.0254	-.0348	13.	.2270	-.2040	.0106	.0278	0	0	0
1700	2	-.1780	.0831	.0070	.1221	.0329	-.0385	13.	.2110	0.0000	0.0000	0.0000	0	0	0
1700	3	-.2345	-.0146	-.0300	.1020	.0025	-.0345	10.	.2130	0.0000	0.0000	0.0000	0	0	0
1730	1	-.3536	-.0105	.0370	.3686	.0603	-.0613	12.	.3100	-.0307	-.0065	-.0040	0	0	0
1730	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1730	3	-.4059	-.0083	-.3130	.2896	.0878	-.0488	11.	.2910	0.0000	0.0000	0.0000	0	0	0
1800	1	-.3704	-.0073	.0340	.3087	.0092	-.0520	11.	.2920	.0410	-.0022	-.0169	0	0	0
1800	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1800	3	-.4262	-.0077	-.5080	.4335	.0985	-.0437	12.	.3080	0.0000	0.0000	0.0000	0	0	0
1900	1	-.2797	-.0035	.0980	.2417	-.0207	-.0514	10.	.2640	.0967	-.0068	-.0261	0	0	0
1900	2	-.3162	.1361	-.1400	.1906	.0690	-.0590	10.	.2310	0.0000	0.0000	0.0000	0	0	0
1900	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1930	1	-.2764	-.0081	.0320	.1647	.0327	-.0347	9.	.2520	.0521	.0200	-.0173	0	0	0
1930	2	-.3080	.1359	-.1550	.0954	.1309	-.0296	10.	.1980	0.0000	0.0000	0.0000	0	0	0
1930	3	-.0329	-.0210	-.0310	.0967	2.2511	-.1166	14.	.2520	0.0000	0.0000	0.0000	0	0	0
2000	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2000	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2000	3	-.4174	-.0094	-.2750	-.0594	.1961	-.0819	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
42767															
930	1	-.2132	-.0104	.0180	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
930	2	-.0632	.0369	-.0300	-.3466	.0908	.2185	11.	.4690	0.0000	0.0000	0.0000	0	0	0
930	3	-.1673	-.0104	-.0190	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1000	1	-.1256	-.0075	.0190	-.6398	-.0775	.2512	12.	.7420	-.9212	-.4618	.3438	0	0	0
1000	2	.0032	.0362	-.0720	-.3979	-.0483	.2532	11.	.5570	0.0000	0.0000	0.0000	0	0	0
1000	3	-.0961	-.0138	-.0180	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1030	1	-.1736	-.0077	.0270	-.9508	.0861	.2325	13.	.7740	-.9108	-.1764	.3499	0	0	0
1030	2	-.0566	.0361	-.0540	-.8701	.1076	.2706	12.	.6330	0.0000	0.0000	0.0000	0	0	0
1030	3	-.1965	-.0078	-.0230	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1100	1	-.0436	-.0060	.0280	-.6709	-.2798	.2366	13.	.8920	-.9550	-.2651	.3497	0	0	0
1100	2	.1073	.0342	-.0970	-.4894	-.3682	.2942	12.	.6140	0.0000	0.0000	0.0000	0	0	0
1100	3	-.0396	-.0167	-.0370	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1130	1	.2664	-.0027	.0410	-.6445	-.0730	.2401	13.	.9110	-.5928	.2044	.3257	0	0	0
1130	2	.3947	.0053	-.1170	-.5910	-.0206	.2056	12.	.5900	0.0000	0.0000	0.0000	0	0	0
1130	3	.2781	-.0247	-.0180	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1200	1	.3998	.0035	.0200	-.6698	.0001	.2080	13.	.8390	-1.0630	.1294	.2589	0	0	0
1200	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1200	3	.3597	-.0246	.0300	-.2260	-.1310	.2259	14.	.8130	0.0000	0.0000	0.0000	0	0	0
1400	1	-.0145	-.0042	.0350	-.7450	.1479	.1799	13.	.6520	-1.5430	.2700	.3611	0	0	0
1400	2	.0414	.0343	-.0750	-.5774	.0436	.2027	12.	.7350	0.0000	0.0000	0.0000	0	0	0
1400	3	-.0188	-.0159	-.0210	-.8601	.0595	.2058	14.	.6490	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND	F ELEV	FSD ANGLE	G AZIM	GSD ANGLE	WIND DIR	WIND SHIFT
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC..........				......DYNES/CM2-......			CM/SEC	RAD	RAD	RAD	RAD	RAD	RAD
42767															
1430	1	494.93	118.19	116.42	50.65	-2.272	-1.203	0.000	507.95	.003	.107	-.093	.227	0.000	0.000
1430	2	642.40	116.65	133.62	56.58	-2.434	.534	0.000	655.04	.052	.091	-.048	.202	0.000	0.000
1430	3	548.77	126.63	122.33	55.13	-2.254	-2.034	0.000	555.47	-.011	.104	-.069	.218	0.000	0.000
1500	1	434.31	104.37	110.81	44.32	-1.538	1.694	0.000	447.35	.007	.107	.108	.239	0.000	0.000
1500	2	557.22	108.71	138.32	49.67	-1.907	4.122	0.000	572.67	.035	.094	.160	.232	0.000	0.000
1500	3	480.81	109.90	121.21	46.79	-1.779	2.620	0.000	487.55	-.011	.103	.112	.243	0.000	0.000
1530	1	486.37	115.82	112.39	48.71	-2.036	2.200	0.000	499.10	.002	.104	.013	.229	0.000	0.000
1530	2	624.85	124.71	134.83	53.34	-2.199	2.262	0.000	638.99	.035	.089	.081	.218	0.000	0.000
1530	3	513.45	114.91	115.34	50.21	-1.767	3.298	0.000	520.33	-.014	.102	.044	.227	0.000	0.000
1600	1	494.72	120.76	84.35	50.00	-2.064	.344	0.000	501.72	.005	.105	.064	.169	0.000	0.000
1600	2	659.61	120.66	97.94	53.94	-2.088	-1.255	0.000	666.29	.033	.084	.113	.145	0.000	0.000
1600	3	545.42	111.19	99.93	53.58	-1.965	-.050	0.000	549.77	-.013	.102	.073	.181	0.000	0.000
1630	1	524.00	115.97	101.87	52.74	-2.295	.537	0.000	533.61	.002	.105	-.051	.191	0.000	0.000
1630	2	694.52	107.58	118.76	57.52	-2.249	-.343	0.000	703.91	.044	.085	.010	.169	0.000	0.000
1630	3	580.22	117.00	112.13	55.60	-2.190	-.320	0.000	585.71	-.011	.100	-.057	.191	0.000	0.000
1700	1	408.37	166.15	106.59	41.93	-1.429	3.344	0.000	420.56	-.001	.100	-.241	.245	0.000	0.000
1700	2	589.37	155.52	145.41	44.68	-1.381	1.345	0.000	605.23	.041	.074	-.211	.232	0.000	0.000
1700	3	452.14	152.28	99.82	44.46	-1.587	-.520	0.000	452.76	0.000	.109	-.232	.227	0.000	0.000
1800	1	327.77	89.74	41.76	30.33	-.819	-.175	0.000	330.10	.010	.097	.380	.120	0.000	0.000
1800	2	419.82	84.42	57.51	38.30	-1.059	-.354	0.000	423.16	.014	.094	.392	.130	0.000	0.000
1800	3	333.77	115.64	42.10	29.02	-.560	-2.469	0.000	320.41	-.025	.129	.493	.174	0.000	0.000
1900	1	184.89	39.66	29.30	18.24	-.197	.005	0.000	187.01	-.006	.096	-.010	.149	0.000	0.000
1900	2	274.11	37.93	34.00	1.01	-.205	-.036	0.000	275.96	.036	.069	0.000	.117	0.000	.000
1900	3	213.47	41.93	31.78	19.28	-.245	-.197	0.000	214.63	-.012	.090	-.042	.144	0.000	0.000
1930	1	291.01	59.40	40.11	29.97	-.629	.008	0.000	293.69	-.007	.107	-.221	.138	0.000	0.000
1930	2	397.97	56.50	42.67	30.83	-.610	.340	0.000	399.72	.050	.079	-.198	.106	0.000	0.000
1930	3	310.37	60.83	40.20	30.28	-.713	-.212	0.000	314.76	-.005	.100	-.211	.129	0.000	0.000
2000	1	247.86	60.14	38.52	24.84	-.423	.997	0.000	250.68	-.003	.101	-.135	.149	0.000	0.000
2000	2	357.02	62.92	43.23	25.83	-.344	1.485	0.000	359.28	.037	.073	-.102	.117	0.000	0.000
2000	3	280.52	64.95	40.42	26.81	-.522	.516	0.000	281.34	-.011	.097	-.115	.143	0.000	0.000
2030	1	158.24	92.71	37.07	18.95	-.066	-2.221	0.000	152.44	-.008	.116	.173	.260	0.000	0.000
2030	2	226.33	124.34	41.92	23.52	-.274	-3.489	0.000	230.61	.038	.120	.160	.246	0.000	0.000
2030	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
2300	1	149.65	19.26	22.86	10.59	-.067	.081	0.000	151.35	-.005	.069	-.035	.149	0.000	0.000
2300	2	263.88	25.67	34.01	11.41	-.088	.114	0.000	265.77	.041	.043	-.125	.126	0.000	0.000
2300	3	165.15	23.43	23.82	10.96	-.072	-.118	0.000	164.54	-.016	.066	-.208	.143	0.000	0.000
2330	1	143.43	25.86	22.52	12.54	-.106	-.058	0.000	145.19	0.000	.087	0.000	.158	0.000	0.000
2330	2	246.05	26.78	8.76	17.66	-.042	.037	0.000	247.27	.038	.057		27.302	0.000	0.000
2330	3	154.89	21.07	21.24	11.40	-.079	-.085	0.000	155.36	-.019	.073	-.095	.136	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENT	ST DEV IGRADE	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER THOUSAND	F	G
42767															
1430	1	-.0953	-.0056	.0450	-.5887	.0216	.1537	13.	.5580	-1.4133	-.0376	.3716	0	0	0
1430	2	-.0478	.0481	-.0540	-.3988	-.0470	.1847	12.	.4800	0.0000	0.0000	0.0000	0	0	0
1430	3	-.0728	-.0188	-.0160	-.5894	-.0042	.1609	14.	.5130	0.0000	0.0000	0.0000	0	0	0
1500	1	.1149	.0001	.0370	-.4478	.0324	.1312	14.	.5480	-1.0473	.3790	.3260	0	0	0
1500	2	.1704	.0301	-.0690	-.3917	-.0663	.1310	13.	.4200	0.0000	0.0000	0.0000	0	0	0
1500	3	.1170	-.0189	-.0200	-.5244	-.0190	.1315	14.	.5150	0.0000	0.0000	0.0000	0	0	0
1530	1	.0218	-.0051	.0390	-.4027	.0039	.1053	14.	.4810	-1.0723	.0133	.2796	0	0	0
1530	2	.0872	.0313	-.0590	-.4147	-.0729	.1251	13.	.3750	0.0000	0.0000	0.0000	0	0	0
1530	3	.0533	-.0208	-.0230	-.4782	-.1563	.1074	14.	.4910	0.0000	0.0000	0.0000	0	0	0
1600	1	.0664	-.0027	.0450	-.1922	-.1449	.0316	13.	.5680	0.0000	0.0000	0.0000	0	0	0
1600	2	.1114	.0298	-.0680	-.1275	-.0920	.0338	12.	.3560	0.0000	0.0000	0.0000	0	0	0
1600	3	.0726	-.0200	-.0080	-.0234	-.1160	.0223	13.	.4240	0.0000	0.0000	0.0000	0	0	0
1630	1	-.0501	-.0055	.0220	-.0554	.0081	.0036	12.	.3430	-.7234	-.0057	.1579	0	0	0
1630	2	-.0114	.0408	-.0680	-.0885	.0232	.0272	12.	.1710	0.0000	0.0000	0.0000	0	0	0
1630	3	-.0567	-.0176	-.0280	-.0779	-.0478	.0036	13.	.2130	0.0000	0.0000	0.0000	0	0	0
1700	1	-.2466	-.0068	0.0000	1.1628	.0407	-.0045	11.	.4690	-1.0444	-.4505	.0813	0	0	0
1700	2	-.2145	.0409	-.0280	.2591	.4825	.0103	11.	.4340	0.0000	0.0000	0.0000	0	0	0
1700	3	-.2368	-.0079	-.0320	-.4969	.4878	-.0699	12.	.4440	0.0000	0.0000	0.0000	0	0	0
1800	1	.3816	.0037	.0040	.4592	-.1147	-.0727	9.	.5280	-.0497	-.0512	-.0062	0	0	0
1800	2	.3927	.0094	-.1290	.2272	-.1489	-.0568	10.	.3010	0.0000	0.0000	0.0000	0	0	0
1800	3	.4668	-.0260	-.0710	-.3878	-.3248	-.0878	10.	.5020	0.0000	0.0000	0.0000	0	0	0
1900	1	-.0096	-.0109	.0610	.2456	.0078	-.0493	6.	.6160	.0869	-.0201	-.0318	0	0	0
1900	2	.0006	.0290	.0800	.0837	.0195	-.0294	9.	.2430	0.0000	0.0000	0.0000	0	0	0
1900	3	-.0456	-.0169	-.0030	.2093	.0117	-.0577	7.	.5460	.1015	.0046	.0017	0	0	0
1930	1	-.2228	-.0136	.0640	.2704	-.0055	-.0710	6.	.4080	.1232	.0020	-.0403	0	0	0
1930	2	-.1972	.0471	-.0480	.1662	.0445	-.0529	7.	.2550	0.0000	0.0000	0.0000	0	0	0
1930	3	-.2115	-.0120	-.0200	.2909	.0054	-.0802	7.	.4030	0.0000	0.0000	0.0000	0	0	0
2000	1	-.1234	-.0094	.0060	.1987	-.0150	-.0567	5.	.4320	.1334	.0148	-.0343	0	0	0
2000	2	-.0941	.0350	-.0730	.0087	-.0570	-.0395	6.	.2590	0.0000	0.0000	0.0000	0	0	0
2000	3	-.1100	-.0169	-.0140	.2564	-.0174	-.0667	6.	.4280	0.0000	0.0000	0.0000	0	0	0
2030	1	.0942	-.0092	.0410	.6790	-.1263	-.0315	5.	.6110	.0969	-.0376	-.0247	0	0	0
2030	2	.0829	.0339	.0060	.5215	-.1006	-.0312	6.	.3330	0.0000	0.0000	0.0000	0	0	0
2030	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2300	1	-.0329	-.0080	.0240	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2300	2	-.1244	.0404	-.0570	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2300	3	-.2092	-.0193	-.0320	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2330	1	-.0029	-.0047	.0480	.0823	-.0205	-.0270	2.	[illegible]	.0609	-.0011	-.0201	0	0	0
2330	2	-1.5704	.0374	-.4020	-.0001	-.0390	-.0218	2.	[illegible]	0.0000	.0081	.0034	0	0	0
2330	3	-.0981	-.0219	-.0310	.0464	-.0228	-.0183	2.	1.3870	0.0000	0.0000	0.0000	0	0	0

42867 TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND	F ELEV	FSD ANGLE	G AZIM	GSD ANGLE	WIND DIR	WIND SHIFT
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC........				......DYNES/CM2.......			CM/SEC	RAD	RAD	RAD	RAD	9AD	RAD
	1	104.27	12.38	18.11	4.15	-.009	.127	0.000	105.81	-.002	.039	.075	.171	0.000	0.000
	2	180.35	18.66	28.65	7.88	-.027	-.343	0.000	182.50	.032	.043	-.002	.159	0.000	0.000
	3	115.67	12.22	22.80	4.81	-.011	-.027	0.000	116.90	-.022	.039	-.028	.197	0.000	0.000
30	1	110.08	24.58	31.58	8.27	-.037	-.101	0.000	114.44	-.002	.081	.026	.279	0.000	0.000
30	2	200.90	25.96	51.41	10.07	-.043	-.718	0.000	207.18	.035	.049	-.046	.251	0.000	0.000
30	3	118.46	20.87	32.16	6.14	-.016	-.209	0.000	120.73	-.019	.052	-.060	.268	0.000	0.000
100	1	135.61	33.02	24.26	12.09	-.096	-.287	0.000	137.96	0.000	.085	-.236	.196	0.000	0.000
100	2	228.66	41.33	24.82	14.29	-.127	-.107	0.000	229.64	.051	.061	-.337	.114	0.000	0.000
100	3	156.94	28.82	21.86	12.33	-.078	-.225	0.000	154.47	-.009	.079	-.319	.156	0.000	0.000
130	1	102.48	31.61	19.66	8.13	-.037	-.218	0.000	104.17	-.004	.069	-.160	.179	0.000	0.000
130	2	189.93	41.76	26.55	9.82	-.051	.106	0.000	191.43	.045	.049	-.282	.134	0.000	0.000
130	3	118.73	31.90	20.63	10.13	-.055	-.170	0.000	118.36	-.009	.087	-.227	.180	0.000	0.000
230	1	73.78	27.34	19.28	1.61	0.000	-.160	0.000	76.51	-.009	.036	-.158	.301	0.000	0.000
230	2	150.90	29.57	26.14	2.94	-.012	.080	0.000	152.94	.037	.020	-.103	.169	0.000	0.000
230	3	83.51	31.14	21.36	1.96	-.020	-.058	0.000	84.60	-.003	.072	-.249	.335	0.000	0.000
400	1	104.42	41.09	26.29	9.43	-.057	.500	0.000	107.43	.017	.078	-.001	.240	0.000	0.000
400	2	167.04	51.26	40.45	16.54	-.150	.688	0.000	171.56	.016	.099	.163	.234	0.000	0.000
400	3	102.98	44.77	26.14	[illegible]	-.071	.357	0.000	104.66	-.003	.085	-.030	.273	0.000	0.000
430	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
430	2	137.42	31.39	26.03	6.49	-.019	-.074	0.000	139.63	.046	.057	-.373	.190	0.000	0.000
430	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
500	1	93.33	32.04	21.68	8.64	-.050	.180	0.000	95.76	.016	.087	-.305	.234	0.000	0.000
500	2	153.75	37.60	31.55	14.30	-.110	.448	0.000	156.86	.040	.089	-.234	.209	0.000	0.000
500	3	[illegible]	25.64	21.15	8.15	-.028	.226	0.000	108.32	0.000	.079	-.221	.226	0.000	0.000
700	1	112.83	55.52	43.69	15.34	-.200	.676	0.000	119.87	.017	.159	-.128	.334	0.000	0.000
700	2	140.27	60.17	53.41	21.14	-.133	.290	0.000	148.54	.023	.145	-.002	.317	0.000	0.000
700	3	138.30	40.50	57.02	16.27	-.166	-.186	0.000	144.47	.003	.137	-.067	.400	0.000	0.000
50267															
1430	1	197.06	147.94	88.38	23.24	-.434	.195	0.000	210.44	.010	.144	.018	.346	0.000	0.000
1430	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1430	3	188.13	141.87	73.31	20.09	-.264	-2.203	0.000	200.44	.009	.160	.015	.350	0.000	0.000
1530	1	267.63	106.13	82.65	29.37	-.756	2.527	0.000	279.52	.011	.128	.042	.319	0.000	0.000
1530	2	334.80	119.69	98.91	[illegible]	-.187	5.742	0.000	351.87	.009	.060	.048	.323	0.000	0.000
1530	3	271.62	101.65	79.41	24.42	-.433	1.339	0.000	283.21	-.008	.109	-.030	.269	0.000	0.000
1600	1	290.65	82.73	87.70	29.57	-.695	.978	0.000	302.72	.007	.105	.091	.283	0.000	0.000
1600	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1600	3	308.84	70.71	66.84	26.18	-.561	-.172	0.000	316.79	-.010	.087	.024	.210	0.000	0.000
1630	1	394.64	95.60	83.92	[illegible]	-1.203	-1.438	0.000	403.24	.006	.105	.065	.209	0.000	0.000
1630	2	508.92	118.84	89.87	[illegible]	-1.476	-2.561	0.000	518.16	.016	.091	.081	.183	0.000	0.000
1630	3	410.75	88.27	77.36	[illegible]	-.853	-.663	0.000	418.63	-.014	.086	.004	.181	0.000	0.000

D30A

CORRECTED DATA FOR SITE 3, MAY 2, 1967, Pages D30-D35

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND	F ELEV	FSD ANGLE	G AZIM	GSD ANGLE
		........CM/SEC	WIND ST DEV	....		REYNOLDS STRESSES	......DYNES/CM2	......	CM/SEC	RAD	RAD	RAD	RAD
50267													
1430	3	188.53	142.71	86.26	23.67	-.215	-2.907	0.000	200.44	.011	.188	.017	.412
1530	3	271.64	101.64	93.53	28.76	-.516	1.549	0.000	283.21	-.010	.129	-.036	.317
1600	3	308.88	70.74	78.72	30.83	-.667	-.146	0.000	316.79	-.012	.103	.028	.247
1630	3	410.78	88.33	91.12	41.17	-1.015	-.775	0.000	418.63	-.017	.102	.005	.213
1705	3	478.04	101.63	73.00	46.59	-1.582	-.392	0.000	481.29	-.007	.101	-.173	.153
1735	3	333.08	75.51	44.87	30.73	-.743	-1.002	0.000	333.11	-.005	.095	-.291	.138
1800	3	273.05	62.06	37.56	26.32	-.445	-.352	0.000	274.58	-.008	.097	-.145	.136
1830	3	212.27	45.88	34.90	18.97	-.226	-.388	0.000	213.94	-.023	.088	.188	.163
1900	3	186.54	37.79	20.17	15.04	-.152	.004	0.000	186.20	-.029	.079	.266	.105
1930	3	201.85	38.63	28.46	18.40	-.208	.070	0.000	203.20	-.019	.091	-.116	.139
2000	3	205.29	37.89	27.97	19.93	-.273	-.084	0.000	206.50	-.016	.098	-.133	.136
2030	3	211.00	40.42	29.72	20.82	-.294	-.157	0.000	212.19	-.013	.100	-.160	.140
2100	3	192.26	38.80	17.79	16.62	-.135	.193	0.000	189.86	-.001	.080	-.440	.083
2136	3	180.94	35.10	23.03	15.89	-.163	.098	0.000	180.27	-.005	.086	-.356	.123
2200	3	198.64	42.91	28.90	17.79	-.193	-.255	0.000	199.35	-.006	.088	-.237	.143
2230	3	183.71	30.43	27.31	16.61	-.172	.020	0.000	185.30	-.012	.091	-.061	.148
2305	3	166.17	35.72	23.28	15.61	-.158	-.281	0.000	167.36	-.010	.093	-.090	.142
2330	3	160.92	48.60	24.48	14.63	-.119	-.528	0.000	161.93	-.029	.082	.172	.144

TIME START	SITE	ETA	THETA	BETA	HU	HV	HW	AIR TEMP MEAN	ST DEV	EU	EV	EW
		RAD	RAD	RAD	SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....		
50267												
1430	3	-.1226	-.0115	-.0150	.5517	-.3757	.0209	20.	.5150	0.0000	0.0000	0.0000
1530	3	-.0100	-.0203	-.0310	-.0175	-.2056	.0422	20.	.3820	0.0000	0.0000	0.0000
1600	3	.0258	-.0199	-.0320	-.0737	-.0139	.0170	20.	.1670	0.0000	0.0000	0.0000
1630	3	.0007	-.0231	-.0430	-.0824	.0246	-.0133	19.	.2480	0.0000	0.0000	0.0000
1705	3	-.1802	-.0140	-.0090	.1850	.0076	-.0444	18.	.1560	0.0000	0.0000	0.0000
1735	3	-.2987	-.0110	-.0520	.4301	-.1163	-.0594	18.	.4750	0.0000	0.0000	0.0000
1800	3	-.1500	-.0142	.0130	.5410	-.0672	-.0561	16.	.6640	0.0000	0.0000	0.0000
1830	3	.1810	-.0272	-.0240	.4629	-.1486	-.0374	13.	.9840	0.0000	0.0000	0.0000
1900	3	.2662	-.0329	-.0520	.0244	-.0024	-.0230	11.	.5290	0.0000	0.0000	0.0000
1930	3	-.1146	-.0239	-.0300	.1257	.0007	-.0330	9.	.4090	0.0000	0.0000	0.0000
2000	3	-.1347	-.0219	-.0190	.1341	.0117	-.0342	9.	.3650	0.0000	0.0000	0.0000
2030	3	-.1636	-.0196	-.0200	.1919	-.0246	-.0362	8.	.3590	0.0000	0.0000	0.0000
2100	3	-.4340	-.0063	-.4290	.1668	.0161	-.0231	8.	.3200	0.0000	0.0000	0.0000
2136	3	-.3516	-.0093	-.0650	.1183	-.0265	-.0237	8.	.3000	0.0000	0.0000	0.0000
2200	3	-.2431	-.0128	-.0300	.1800	-.0063	-.0236	7.	.3280	0.0000	0.0000	0.0000
2230	3	-.0612	-.0173	-.0050	.0869	-.0317	-.0233	7.	.3010	0.0000	0.0000	0.0000
2305	3	-.1003	-.0151	-.0180	.1138	-.0237	-.0225	7.	.2970	0.0000	0.0000	0.0000
2330	3	.1557	-.0320	0.0000	.2535	-.0627	-.0159	6.	.3770	0.0000	0.0000	0.0000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	AIR TEMP ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER THOUSAND	F	G
42867															
	1	.0848	-.0031	.0290	.0596	.0876	-.0025	2.	.5140	.0349	.0337	-.0020	0	0	0
	2	-.0114	.0329	-.0580	.0040	.0280	-.0033	2.	.2980	0.0000	0.0000	0.0000	0	0	0
	3	-.0300	-.0235	-.0210	.0348	.0269	-.0039	2.	.3610	0.0000	0.0000	0.0000	0	0	0
30	1	.0250	-.0048	.0120	.0860	-.0693	-.0101	1.	.3810	0.0000	0.0000	0.0000	0	0	0
30	2	-.0578	.0361	-.0510	.0505	-.0407	-.0073	2.	.1760	0.0000	0.0000	0.0000	0	0	0
30	3	-.0696	-.0209	-.0360	.0722	-.1035	-.0042	1.	.4200	0.0000	0.0000	0.0000	0	0	0
100	1	-.2507	-.0044	.0240	.1135	-.0340	-.0203	1.	.3120	0.0000	0.0000	0.0000	0	0	0
100	2	-.3412	.0505	-.0500	.1142	.0065	-.0129	2.	.2070	0.0000	0.0000	0.0000	0	0	0
100	3	-.3216	-.0122	-.0010	.1085	-.0472	-.0211	2.	.3500	0.0000	0.0000	0.0000	0	0	0
130	1	-.1730	-.0069	.0310	.0591	-.0206	-.0091	1.	.2400	0.0000	0.0000	0.0000	0	0	0
130	2	-.2777	.0444	-.0470	.0520	.0034	-.0066	2.	.1390	0.0000	0.0000	0.0000	0	0	0
130	3	-.2335	-.0117	-.0260	.0634	-.0505	-.0006	1.	.3370	0.0000	0.0000	0.0000	0	0	0
230	1	-.1647	-.0086	.0150	.0671	-.0738	.0058	1.	.3390	0.0000	0.0000	0.0000	0	0	0
230	2	-.0975	.0369	-.0550	.0399	.0701	-.0003	2.	.5550	0.0000	0.0000	0.0000	0	0	0
230	3	-.2040	-.0160	-.0280	.1039	-.0083	-.0023	1.	.2630	0.0000	0.0000	0.0000	0	0	0
400	1	.0429	.0140	.0050	-.0499	-.0085	-.0094	0.	.3710	0.0000	0.0000	0.0000	0	0	0
400	2	.1865	.0115	-.0670	.0328	.0914	-.0150	0.	.2700	0.0000	0.0000	0.0000	0	0	0
400	3	.0314	-.0147	-.0310	-.0301	.0357	-.0095	0.	.3600	0.0000	0.0000	0.0000	0	0	0
430	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
430	2	-.3717	.0467	-.0380	.0203	-.0146	-.0009	0.	.2500	0.0000	0.0000	0.0000	0	0	0
430	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
500	1	-.2752	.0125	.0280	.0158	-.0388	-.0102	0.	.4100	0.0000	0.0000	0.0000	0	0	0
500	2	-.2152	.0382	.0030	+0306	-.0245	-.0089	0.	.2260	0.0000	0.0000	0.0000	0	0	0
500	3	-.1927	-.0042	-.0330	-.0271	-.0684	-.0100	0.	.4410	0.0000	0.0000	0.0000	0	0	0
700	1	-.0960	.0029	.0030	-.4100	-.0005	.0579	5.	.6260	-.2126	-.0685	.0599	0	0	0
700	2	.0045	.0204	-.0490	.0779	-.1799	.0586	4.	.3790	0.0000	0.0000	0.0000	0	0	0
700	3	-.0706	-.0062	-.0270	-.0353	-.1347	.0593	5.	.6000	0.0000	0.0000	0.0000	0	0	0
50267															
1430	1	-.0043	.0023	.0210	-.3438	-.6068	.0714	20.	.5320	3.2180	-.5140	.2000	0	0	0
1430	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1430	3	-.1042	-.0038	-.0150	.5378	-.3196	.0177	20.	.5150	0.0000	0.0000	0.0000	0	0	0
1530	1	.0979	.0022	.0240	-.4249	-.0257	.0403	20.	.2540	-.3104	.4049	.3169	0	0	0
1530	2	.1132	.0064	-.0290	-.2895	-.0644	.0295	20.	.2390	0.0000	0.0000	0.0000	0	0	0
1530	3	-.0084	-.0172	-.0310	-.0178	-.1745	.0358	20.	.3820	0.0000	0.0000	0.0000	0	0	0
1600	1	.[illegible]762	.0003	.0200	-.1339	.0423	.0164	20.	.2940	-.6413	.1904	.2298	0	0	0
1600	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1600	3	.0219	-.0163	-.0320	-.0735	-.0118	.0144	20.	.1670	0.0000	0.0000	0.0000	0	0	0
1630	1	.0582	-.0002	.0300	-.0884	.0811	-.0190	19.	.3130	-.5724	.0320	.1399	0	0	0
1630	2	.0741	.0114	-.0590	-.1707	.0279	-.0021	19.	.1660	0.0000	0.0000	0.0000	0	0	0
1630	3	.0006	-.0196	-.0430	-.0825	.0208	-.0113	19.	.2480	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	S AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		....	WIND ST DEV ..CM/SEC..........			REYNOLDS STRESSES ......DYNES/CM2.......									
50267															
1705	1	451.49	106.91	83.19	43.10	-1.488	1.857	0.000	458.68	0.000	.100	-.129	.177	0.000	0.000
1705	2	605.23	101.76	97.09	49.65	-1.991	1.300	0.000	614.26	.026	.084	-.127	.157	0.000	0.000
1705	3	475.88	101.07	62.26	39.55	-1.327	-.056	0.000	481.29	-.006	.086	-.151	.130	0.000	0.000
1735	1	329.45	73.92	46.29	30.97	-.680	-.744	0.000	332.54	-.002	.097	-.248	.142	0.000	0.000
1735	2	419.78	67.77	58.83	34.86	-.929	-.891	0.000	425.56	.036	.084	-.236	.137	0.000	0.000
1735	3	329.02	73.76	38.56	26.09	-.615	-.683	0.000	333.11	-.004	.082	-.247	.117	0.000	0.000
1800	1	250.96	62.11	40.97	25.73	-.429	-.183	0.000	254.18	.004	.103	-.090	.163	0.000	0.000
1800	2	351.83	57.74	43.09	25.69	-.420	-.404	0.000	354.84	.025	.073	-.088	.121	0.000	0.000
1800	3	272.19	61.58	31.99	22.34	-.374	-.238	0.000	274.58	-.007	.082	-.123	.116	0.000	0.000
1830	1	206.65	52.31	35.06	20.59	-.272	-.498	0.000	209.33	.009	.098	.256	.161	0.000	0.000
1830	2	292.00	51.22	44.77	22.03	-.291	-.973	0.000	296.97	.000	.073	.267	.150	0.000	0.000
1830	3	211.28	46.01	29.77	16.11	-.189	-.393	0.000	213.94	-.019	.075	.159	.133	0.000	0.000
1900	1	180.07	37.86	20.47	16.18	-.151	-.009	0.000	181.07	.010	.089	.331	.110	0.000	0.000
1900	2	268.23	33.81	23.36	17.67	-.140	.060	0.000	271.14	.002	.063	.229	.083	0.000	0.000
1900	3	184.71	37.33	17.29	12.77	-.127	-.026	0.000	186.20	-.025	.067	.226	.069	0.000	0.000
1930	1	192.72	40.41	28.32	19.02	-.239	-.017	0.000	194.74	.004	.099	-.142	.146	0.000	0.000
1930	2	280.76	37.75	31.72	21.30	-.237	.058	0.000	282.88	.021	.075	-.096	.112	0.000	0.000
1930	3	201.47	38.58	24.20	15.62	-.173	.086	0.000	203.20	-.016	.077	-.098	.118	0.000	0.000
2000	1	201.11	41.46	30.30	20.98	-.298	-.109	0.000	203.32	.005	.107	-.157	.151	0.000	0.000
2000	2	286.22	40.03	31.48	23.06	-.276	-.130	0.000	288.28	.026	.080	-.106	.109	0.000	0.000
2000	3	204.76	37.70	23.80	16.92	-.228	-.041	0.000	206.50	-.013	.083	-.113	.115	0.000	0.000
2030	1	194.38	42.08	29.25	19.79	-.256	-.098	0.000	196.47	.004	.105	-.174	.149	0.000	0.000
2030	2	285.68	41.11	31.57	23.05	-.239	-.261	0.000	287.89	.029	.080	-.144	.109	0.000	0.000
2030	3	210.20	40.11	25.32	17.68	-.246	-.092	0.000	212.19	-.011	.085	-.130	.118	0.000	0.000
2100	1	165.32	42.84	18.32	16.06	-.087	.485	0.000	166.11	-.001	.101	-.445	.108	0.000	0.000
2100	2	258.21	33.00	19.51	17.23	-.155	.002	0.000	261.52	.041	.063	-.421	.070	0.000	0.000
2100	3	187.45	38.12	14.85	13.65	-.111	.176	0.000	189.86	-.001	.068	-.373	.070	0.000	0.000
2136	1	155.69	38.76	19.67	15.01	-.146	.323	0.000	156.79	.005	.100	-.375	.126	0.000	0.000
2136	2	253.12	32.81	32.18	17.78	-.188	-.079	0.000	256.48	.038	.067	-.285	.123	0.000	0.000
2136	3	177.91	34.73	19.87	13.49	-.134	.129	0.000	180.27	-.004	.073	-.302	.105	0.000	0.000
2200	1	185.77	45.00	34.49	18.84	-.272	.068	0.000	188.91	.005	.104	-.126	.186	0.000	0.000
2200	2	276.39	45.26	40.60	20.41	-.254	-.256	0.000	279.70	.025	.073	.011	.148	0.000	0.000
2200	3	197.03	42.27	24.74	15.10	-.161	-.159	0.000	199.35	-.007	.074	-.201	.122	0.000	0.000
2230	1	167.54	31.20	25.22	16.65	-.201	.026	0.000	169.43	.004	.102	-.122	.153	0.000	0.000
2230	2	258.87	30.10	28.88	17.71	-.177	.086	0.000	260.62	.020	.068	.013	.110	0.000	0.000
2230	3	183.61	30.41	23.20	14.10	-.145	.030	0.000	185.30	-.010	.077	-.052	.126	0.000	0.000
2305	1	134.98	46.27	24.50	14.11	-.138	-.636	0.000	137.26	.008	.103	-.048	.197	0.000	0.000
2305	2	228.17	43.32	25.47	16.51	-.160	-.522	0.000	229.79	.024	.073	.024	.118	0.000	0.000
2305	3	165.93	33.47	19.80	13.25	-.132	-.223	0.000	167.36	-.008	.079	-.077	.121	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER THOUSAND		
50267															
1705	1	-.1218	-.0075	.0040	.2710	.0819	-.0499	18.	.3050	-.4030	.0534	.0577	0	0	0
1705	2	-.1253	.0222	-.0400	[illegible]	.0473	-.0448	18.	.1890	0.0000	0.0000	0.0000	0	0	0
1705	3	-.1534	-.0119	-.0080	.1843	.0064	-.0377	18.	.1560	0.0000	0.0000	0.0000	0	0	0
1735	1	-.2550	-.0079	.0280	.4034	-.1130	-.0651	17.	.4870	-.2328	.0118	.0209	0	0	0
1735	2	-.2426	.0326	-.0490	.2270	-.1401	-.0634	18.	.2990	0.0000	0.0000	0.0000	0	0	0
1735	3	-.2557	-.0094	-.0490	.4152	-.1001	-.0503	18.	.4750	0.0000	0.0000	0.0000	0	0	0
1800	1	-.0941	-.0018	.0320	.565	-.0497	-.0580	16.	.7120	-.0919	.0439	-.0414	0	0	0
1800	2	-.0919	.0225	-.0150	.3212	-.0488	-.0469	17.	.4410	0.0000	0.0000	0.0000	0	0	0
1800	3	-.1276	-.0121	.0140	.5363	-.0573	-.0476	16.	.6540	0.0000	0.0000	0.0000	0	0	0
1830	1	.2496	.0037	.0170	.5017	-.1380	-.0363	13.	.8570	.2014	-.0231	-.0370	0	0	0
1830	2	.2611	.0063	-.0360	.3263	-.1434	-.0254	15.	.7170	0.0000	0.0000	0.0000	0	0	0
1830	3	.1541	-.0232	-.0260	.4680	-.1267	-.0318	13.	.9840	0.0000	0.0000	0.0000	0	0	0
1900	1	.3340	.0064	.0860	.0327	-.0033	-.0409	11.	.5780	0.0000	0.0000	0.0000	0	0	0
1900	2	.3332	.0013	-.0130	-.1091	-.0424	-.0233	13.	.5790	0.0000	0.0000	0.0000	0	0	0
1900	3	.2275	-.0282	-.0560	.0243	-.0020	-.0195	11.	.5290	0.0000	0.0000	0.0000	0	0	0
1930	1	-.1425	-.0008	.0530	.1526	-.0225	-.0395	9.	.4670	0.0000	0.0000	0.0000	0	0	0
1930	2	-.0962	.0192	-.0500	.0489	-.0118	-.0310	11.	.3620	0.0000	0.0000	0.0000	0	0	0
1930	3	-.0974	-.0203	-.0290	.1253	.0006	-.0280	9.	.4090	0.0000	0.0000	0.0000	0	0	0
2000	1	-.1602	-.0015	.0590	.1477	.0080	-.0390	9.	.3580	0.0000	0.0000	0.0000	0	0	0
2000	2	-.1088	.0239	.0010	.0716	.0137	-.0316	10.	.2680	0.0000	0.0000	0.0000	0	0	0
2000	3	-.1145	-.0186	-.0180	.1339	.0099	-.0291	9.	.3650	0.0000	0.0000	0.0000	0	0	0
2030	1	-.1768	-.0014	.0460	.1954	-.0139	-.0359	8.	.4010	0.0000	0.0000	0.0000	0	0	0
2030	2	-.1483	.0267	.0640	.1363	-.0265	-.0263	10.	.3130	0.0000	0.0000	0.0000	0	0	0
2030	3	-.1393	-.0167	-.0180	.1898	-.0211	-.0307	8.	.3590	0.0000	0.0000	0.0000	0	0	0
2100	1	-.4332	-.0081	-.2280	.2255	.0422	-.0196	8.	.4470	0.0000	0.0000	0.0000	0	0	0
2100	2	-.4261	.0404	.2050	.0666	-.0093	-.0190	10.	.2690	0.0000	0.0000	0.0000	0	0	0
2100	3	-.3748	-.0055	-.3350	.1631	.0114	-.0200	8.	.3200	0.0000	0.0000	0.0000	0	0	0
2136	1	-.3650	.0002	-.0550	.1811	.0214	[illegible]	7.	.3960	.1349	.0118	-.0257	0	0	0
2136	2	-.2886	.0369	[illegible]	.0226	-.0421	[illegible]	9.	.2750	0.0000	0.0000	0.0000	0	0	0
2136	3	-.3021	-.0080	[illegible]	.1137	-.0230	-.0201	8.	.3000	0.0000	0.0000	0.0000	0	0	0
2200	1	-.1252	-.0008	.0050	.1898	.0444	-.0319	7.	.4020	.1629	.0325	-.0336	0	0	0
2200	2	.0075	.0230	-.0410	.1086	.0640	-.0251	9.	.3090	0.0000	0.0000	0.0000	0	0	0
2200	3	-.2075	-.0109	-.0280	.1780	-.0055	-.0200	7.	.3280	0.0000	0.0000	0.0000	0	0	0
2230	1	-.1214	-.0018	.0210	.0923	-.0084	-.0285	7.	.2930	.0997	-.0045	-.0302	0	0	0
2230	2	.0144	.0187	-.0380	.0529	.0011	-.0175	8.	.2080	0.0000	0.0000	0.0000	0	0	0
2230	3	-.0520	-.0147	-.0050	.0862	-.0269	-.0197	7.	.3010	0.0000	0.0000	0.0000	0	0	0
2305	1	-.0831	.0007	.0460	.2318	-.0648	-.0224	6.	.3860	.1768	-.0438	-.0234	0	0	0
2305	2	.0145	.0223	-.0270	.1102	-.0263	-.0179	8.	.2730	0.0000	0.0000	0.0000	0	0	0
2305	3	-.0852	-.0129	-.0170	.1129	-.0201	-.0191	7.	.2970	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC..........				......DYNES/CM2......									
50267															
2330	1	171.43	42.73	31.03	17.80	-.188	-.371	0.000	174.06	.012	.102	.123	.174	0.000	0.000
2330	2	254.72	44.21	32.44	18.69	-.188	-.543	0.000	257.88	.011	.070	.244	.124	0.000	0.000
2330	3	160.35	48.79	20.85	12.42	-.099	-.475	0.000	161.93	-.024	.069	.146	.122	0.000	0.000
50367															
	1	201.89	39.19	36.62	21.27	-.302	-.060	0.000	205.15	.009	.108	.089	.181	0.000	0.000
	2	292.61	38.20	39.05	22.47	-.279	-.154	0.000	296.41	.013	.077	.216	.134	0.000	0.000
	3	189.34	37.79	33.99	18.59	-.221	.251	0.000	191.68	-.017	.098	.102	.185	0.000	0.000
1130	1	106.66	88.73	44.51	18.40	-.134	-.305	0.000	113.35	.001	.231	-.160	.379	0.000	0.000
1130	2	134.55	91.87	54.48	26.53	.068	-2.059	0.000	145.70	.002	.230	-.111	.389	0.000	0.000
1130	3	110.33	89.59	42.65	19.10	-.202	-.910	0.000	115.28	.015	.209	-.174	.374	0.000	0.000
1230	1	210.72	122.18	68.41	23.57	-.415	1.666	0.000	219.82	.008	.144	.173	.312	0.000	0.000
1230	2	249.29	127.89	85.65	33.90	-.481	2.148	0.000	263.86	.007	.168	.213	.315	0.000	0.000
1230	3	220.58	106.64	70.10	27.59	-.602	.648	0.000	226.94	-.013	.159	.274	.296	0.000	0.000
1306	1	273.55	105.74	43.24	25.26	-.519	-.666	0.000	276.14	.013	.098	.354	.159	0.000	0.000
1306	2	329.60	104.24	59.67	36.67	-.706	-2.279	0.000	337.81	.007	.125	.395	.166	0.000	0.000
1306	3	272.74	98.86	49.53	28.29	-.694	-1.301	0.000	273.36	-.015	.128	.370	.186	0.000	0.000
1330	1	224.96	102.04	71.03	25.02	-.260	2.557	0.000	235.52	-.002	.137	.089	.331	0.000	0.000
1330	2	270.67	118.17	84.56	33.74	-.090	3.365	0.000	284.72	0.000	.163	.102	.312	0.000	0.000
1330	3	238.23	106.32	75.93	26.30	-.543	3.336	0.000	247.39	-.008	.154	.082	.343	0.000	0.000
1400	1	187.21	81.11	62.69	19.36	-.272	1.455	0.000	196.27	.005	.127	.070	.314	0.000	0.000
1400	2	219.99	86.28	80.53	27.21	-.313	.332	0.000	235.16	.008	.144	.119	.344	0.000	0.000
1400	3	185.98	88.14	65.60	20.83	-.378	.007	0.000	194.40	-.002	.145	.115	.345	0.000	0.000
1430	1	201.83	84.40	43.33	22.34	-.196	.197	0.000	206.01	.006	.142	.298	.218	0.000	0.000
1430	2	225.35	98.70	54.07	32.57	-.387	-.549	0.000	233.27	.005	.186	.328	.231	0.000	0.000
1430	3	180.83	100.05	52.51	23.87	-.540	.050	0.000	185.24	.001	.166	.263	.295	0.000	0.000
1600	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1600	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1600	3	164.33	85.66	39.55	16.99	-.445	.111	0.000	158.48	.032	.193		.284	.244	0.000
1630	1	281.82	67.48	72.00	28.68	-.503	1.097	0.000	290.85	.004	.105	.145	.257	0.000	0.000
1630	2	351.02	75.15	85.02	32.95	-.712	.984	0.000	363.24	.015	.097	.149	.246	0.000	0.000
1630	3	284.20	69.89	70.10	29.08	-.606	.925	0.000	290.77	-.015	.106	.134	.251	0.000	0.000
1700	1	293.50	71.57	56.68	29.70	-.744	.258	0.000	298.79	.005	.106	.030	.191	0.000	0.000
1700	2	361.97	62.31	65.79	33.90	-.648	.302	0.000	388.32	.014	.090	.027	.171	0.000	0.000
1700	3	294.28	63.62	56.46	29.83	-.669	-.308	0.000	298.59	-.014	.105	0.000	.189	0.000	0.000
1730	1	255.60	60.96	44.70	26.40	-.515	-.295	0.000	259.27	.008	.106	-.060	.168	0.000	0.000
1730	2	353.93	66.98	46.91	30.28	-.592	-.375	0.000	357.35	.023	.086	-.062	.129	0.000	0.000
1730	3	275.93	68.53	42.98	27.98	-.584	.046	0.000	278.40	-.013	.103	-.065	.151	0.000	0.000
1800	1	227.09	61.31	33.96	23.20	-.399	.127	0.000	229.47	.006	.103	-.043	.145	0.000	0.000
1800	2	318.68	57.89	37.54	26.35	-.385	.095	0.000	321.00	.023	.080	-.059	.110	0.000	0.000
1800	3	244.21	58.77	33.01	23.75	-.422	-.089	0.000	245.80	-.014	.098	-.068	.130	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER THOUSAND		
50267															
2330	1	.1139	.0067	.0550	.1472	-.0391	-.0276	6.	.3200	.1482	-.0397	-.0278	0	0	0
2330	2	.2390	.0093	-.0280	.0239	.0074	-.0202	7.	.2400	0.0000	0.0000	0.0000	0	0	0
2330	3	.1325	-.0280	-.0010	.2551	-.0534	-.0135	6.	.3770	0.0000	0.0000	0.0000	0	0	0
50367															
	1	.0893	.0026	.0210	.0921	-.0147	-.0305	6.	.2920	.0940	-.0166	-.0307	0	0	0
	2	.2164	.0104	-.0340	.0462	-.0227	-.0270	7.	.2520	0.0000	0.0000	0.0000	0	0	0
	3	.1088	-.0234	-.0480	.0807	.0107	-.0244	6.	.2630	0.0000	0.0000	0.0000	0	0	0
1130	1	-.2460	-.0122	.0410	-.0552	.2701	.0380	17.	.8980	0.0000	0.0000	0.0000	0	0	0
1130	2	-.2241	.0178	-.0590	-.8854	-.0601	.1526	17.	.5960	0.0000	0.0000	0.0000	0	0	0
1130	3	-.2852	-.0005	-.0860	.5758	-.1126	.1674	10.	.9120	0.0000	0.0000	0.0000	0	0	0
1230	1	.2231	-.0012	.0400	-.9307	-.1011	.1497	19.	.7440	.4387	.3076	.4130	0	0	0
1230	2	.2500	-.0013	-.0650	.0274	.0725	.1251	19.	.4090	0.0000	0.0000	0.0000	0	0	0
1230	3	.2664	-.0289	-.0500	.1150	-.0133	.1319	20.	.6930	0.0000	0.0000	0.0000	0	0	0
1306	1	.3674	.0065	.0040	-1.3098	-.0792	.1354	20.	.7560	-.5082	-.1663	.4597	0	0	0
1306	2	.3906	.0016	-.0120	-.3267	.0833	.1652	19.	.5680	0.0000	0.0000	0.0000	0	0	0
1306	3	.3567	-.0234	-.0290	-.1826	.0271	.1296	20.	.6670	0.0000	0.0000	0.0000	0	0	0
1330	1	.1464	-.0009	.0340	-.0764	.1047	.1159	20.	.6860	.8999	.6906	.4339	0	0	0
1330	2	.1542	-.0046	-.0550	-.1007	.0501	.1192	19.	.4670	0.0000	0.0000	0.0000	0	0	0
1330	3	.1463	-.0240	-.0410	-.0509	-.0010	.1292	20.	.6430	0.0000	0.0000	0.0000	0	0	0
1400	1	.1080	-.0005	.0230	-.0925	.2616	.0221	19.	.5560	-.1617	-.3645	.2292	0	0	0
1400	2	.1194	.0024	-.0800	-.0130	.2659	.0466	19.	.3400	0.0000	0.0000	0.0000	0	0	0
1400	3	.1065	-.0175	-.0210	.1310	.2810	.0481	20.	.5490	0.0000	0.0000	0.0000	0	0	0
1430	1	.3039	.0037	.0120	-.5066	-.0119	.0909	20.	.7520	.3888	.0006	.4332	0	0	0
1430	2	.3338	.0038	-.0550	-.5038	.0419	.1084	20.	.5390	0.0000	0.0000	0.0000	0	0	0
1430	3	.2808	-.0163	-.0190	.1830	.0337	.1542	20.	.7220	0.0000	0.0000	0.0000	0	0	0
1600	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1600	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1600	3	.2611	-.0152	-.0152	-.2637	.0374	.0164	20.	.4340	0.0000	0.0000	0.0000	0	0	0
1630	1	.1574	-.0012	.0250	.0453	.1628	-.0127	19.	.3120	-.6176	-.4283	.1704	0	0	0
1630	2	.1558	.0111	-.0400	.0207	.1528	.0006	19.	.1980	0.0000	0.0000	0.0000	0	0	0
1630	3	.1434	-.0231	-.0380	.0511	.1101	-.0083	19.	.1890	0.0000	0.0000	0.0000	0	0	0
1700	1	.0329	-.0021	.0100	.1231	.0674	-.0470	18.	.3440	-1.0475	-2.4206	.1771	0	0	0
1700	2	.0290	.0107	-.0500	.0172	.1124	-.0294	19.	.3150	0.0000	0.0000	0.0000	0	0	0
1700	3	-.0036	-.0215	-.0220	.1342	.0764	-.0418	19.	.3450	0.0000	0.0000	0.0000	0	0	0
1730	1	-.0645	.0019	.0280	.3341	-.0297	-.0585	17.	.4910	1.2322	-.7349	-.0116	0	0	0
1730	2	-.0659	.0195	-.0530	.2770	-.0204	-.0515	18.	.3670	0.0000	0.0000	0.0000	0	0	0
1730	3	-.0651	-.0207	-.0050	.4185	.0001	-.0518	17.	.4820	0.0000	0.0000	0.0000	0	0	0
1800	1	-.0415	.0001	.0180	.5312	.0148	-.0523	15.	.6450	-.1814	.0064	-.0317	0	0	0
1800	2	-.0593	.0205	-.0790	.3337	.0152	-.0396	16.	.4710	0.0000	0.0000	0.0000	0	0	0
1800	3	-.0704	-.0203	-.0220	.4858	-.0171	-.0541	16.	.6190	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		........CM/SEC	WIND ST DEV			......DYNES/CM2	REYNOLDS STRESSES								
50367															
1830	1	232.62	50.64	36.04	23.20	-.361	.034	0.000	235.25	.004	.100	.018	.149	0.000	0.000
1830	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1830	3	242.39	50.86	35.13	23.61	-.374	.014	0.000	244.40	-.014	.098	.001	.143	0.000	0.000
1900	1	222.40	46.10	36.68	23.01	-.353	.034	0.000	225.29	.006	.105	-.080	.160	0.000	0.000
1900	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1900	3	234.48	47.78	35.86	23.10	-.379	-.400	0.000	236.40	-.010	.100	-.107	.151	0.000	0.000
2000	1	253.79	62.74	37.74	26.48	-.539	-.047	0.000	256.50	.003	.108	-.131	.149	0.000	0.000
2000	2	345.42	63.39	42.72	29.66	-.512	-.116	0.000	348.14	.035	.083	.007	.121	0.000	0.000
2000	3	261.18	64.57	38.22	26.40	-.529	-.062	0.000	263.16	-.016	.103	-.089	.144	0.000	0.000
2035	1	297.65	70.41	45.00	30.38	-.776	.484	0.000	300.87	.005	.108	-.225	.149	0.000	0.000
2035	2	386.51	64.19	54.65	34.16	-.770	.932	0.000	390.81	.043	.088	-.122	.138	0.000	0.000
2035	3	325.33	65.19	49.43	32.4[illegible]	-.739	.181	0.000	327.47	-.011	.103	-.178	.150	0.000	0.000
2100	1	250.07	[illegible]7	36.82	26.31	-.518	-.111	0.000	252.65	.005	.111	-.210	.147	0.000	0.000
2100	2	330.57	[illegible]	41.87	29.34	-.485	-.237	0.000	333.52	.048	.090	-.125	.125	0.000	0.000
2100	3	263.97	[illegible]	39.08	26.48	-.452	-.259	0.000	265.57	-.012	.103	-.176	.148	0.000	0.000
2130	1	267.07	70.02	40.04	27.09	-.516	-.464	0.000	269.86	-.002	.106	-.227	.149	0.000	0.000
2130	2	349.27	74.02	45.19	31.75	-.610	-.438	0.000	352.63	.040	.092	-.122	.129	0.000	0.000
2130	3	277.79	68.75	44.87	28.85	-.538	-.741	0.000	279.83	-.011	.107	-.180	.160	0.000	0.000
2200	1	315.97	72.74	38.90	31.54	-.798	.104	0.000	318.15	0.000	.106	-.310	.123	0.000	0.000
2200	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
2200	3	329.33	72.21	45.76	32.85	-.750	.029	0.000	329.65	-.007	.104	-.286	.139	0.000	0.000
2300	1	185.17	35.97	28.04	18.58	-.236	.048	0.000	187.21	0.000	.102	-.086	.148	0.000	0.000
2300	2	271.94	37.25	29.78	21.38	-.282	.037	0.000	273.87	.030	.078	-.115	.109	0.000	0.000
2300	3	211.14	36.29	27.88	20.15	-.283	-.012	0.000	212.29	-.011	.098	-.136	.132	0.000	0.000
2330	1	180.54	35.17	25.72	18.81	-.227	-.028	0.000	182.30	.004	.105	.146	.141	0.000	0.000
2330	2	252.43	32.40	26.42	19.64	-.257	-.061	0.000	254.11	.023	.078	.116	.103	0.000	0.000
2330	3	185.39	36.31	24.90	17.78	-.219	-.132	0.000	186.64	-.021	.097	.053	.132	0.000	0.000
50467															
	1	185.82	43.57	23.70	19.23	-.230	0.000	.004	187.15	.006	.105	.332	.125	0.000	0.000
	2	247.73	45.01	25.69	21.36	-.277	0.000	-.003	250.85	.015	.085	.331	.104	0.000	0.000
	3	175.79	39.72	23.36	18.46	-.203	0.000	-.009	175.76	-.019	.106	.297	.134	0.000	0.000
30	1	186.22	46.94	41.11	21.38	-.348	-.403	0.000	190.88	.012	.121	-.042	.237	0.000	0.000
30	2	249.44	51.83	45.91	25.67	-.315	-.799	0.000	254.59	.031	.103	.155	.194	0.000	0.000
30	3	182.59	48.46	38.48	19.57	-.233	-.688	0.000	185.97	-.015	.116	-.115	.263	0.000	0.000
100	1	152.96	54.70	50.60	18.04	-.249	-.319	0.000	160.96	.017	.117	-.031	.327	0.000	0.000
100	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
100	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1200	1	257.28	99.81	54.24	29.85	-.754	1.539	0.000	269.68	.010	.140	.089	.324	0.000	0.000
1200	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1200	3	274.59	104.30	76.94	29.84	-.705	.532	0.000	281.37	-.020	.135	.254	.275	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER THOUSAND		
50367															
1830	1	.0193	-.0006	.0290	.1265	.0423	-.0553	13.	.6770	.1065	.0480	-.0528	0	0	0
1830	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1830	3	.0011	-.0204	-.0550	.0749	.0785	-.0430	14.	.5950	0.0000	0.0000	0.0000	0	0	0
1900	1	-.0804	0.0000	.0100	.2081	.0276	-.0483	12.	.5100	.1689	.0360	-.0499	0	0	0
1900	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1900	3	-.1135	-.0165	-.0400	.2391	.0021	-.0441	12.	.5160	0.0000	0.0000	0.0000	0	0	0
2000	1	-.1321	-.0040	.0370	.1764	-.0026	-.0404	10.	.3270	.0178	.0167	-.0374	0	0	0
2000	2	.0059	.0328	-.0340	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2000	3	-.0910	-.0229	-.0550	.2006	.0055	-.0340	10.	.2600	0.0000	0.0000	0.0000	0	0	0
2035	1	-.2203	-.0028	.0370	.2840	.0426	-.0476	9.	.3300	.5294	.1405	-.0462	0	0	0
2035	2	-.1188	.0391	-.0690	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2035	3	-.1765	-.0183	-.0220	.2085	.0241	-.0376	10.	.2680	0.0000	0.0000	0.0000	0	0	0
2100	1	-.2122	-.0023	.0700	.2113	-.0254	-.0378	9.	.3500	.1156	-.0054	-.0376	0	0	0
2100	2	-.1285	.0467	.0050	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2100	3	-.1797	-.0181	-.0210	.2021	-.0349	-.0315	9.	.3500	0.0000	0.0000	0.0000	0	0	0
2130	1	-.2343	-.0093	.0250	.1521	-.0144	-.0362	8.	.2820	.0780	.0108	-.0358	0	0	0
2130	2	-.1273	.0371	-.0150	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2130	3	-.1886	-.0173	-.0100	.1951	-.0118	-.0295	9.	.2490	0.0000	0.0000	0.0000	0	0	0
2200	1	-.3113	-.0073	-.0410	.2003	.0015	-.0393	8.	.2720	.1330	.0167	-.0343	0	0	0
2200	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2200	3	-.2862	-.0139	-.0570	.2018	.0071	-.0337	9.	.1950	0.0000	0.0000	0.0000	0	0	0
2300	1	-.0854	-.0054	.0370	.1032	.0052	-.0234	8.	.2970	.0670	.0037	-.0223	0	0	0
2300	2	-.1164	.0277	-.1050	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2300	3	-.1373	-.0179	-.0220	.0851	-.0017	-.0208	8.	.1490	0.0000	0.0000	0.0000	0	0	0
2330	1	.1471	-.0015	.0420	.0925	.0003	-.0213	8.	.2500	.0771	-.0054	-.0213	0	0	0
2330	2	.1162	.0202	.0330	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
2330	3	.0511	-.0271	-.0150	.1047	-.0128	-.0196	8.	.2270	0.0000	0.0000	0.0000	0	0	0
50467															
	1	.3350	.0007	.0200	.1149	-.0022	-.0200	7.	.2150	.0711	.0019	-.0210	0	0	0
	2	.3366	.0117	-.0150	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
	3	.2920	-.0254	-.0315	.0973	-.0115	-.0154	8.	.2310	0.0000	0.0000	0.0000	0	0	0
30	1	-.0552	.0029	.0270	.0888	.0298	-.0283	7.	.2580	.0911	.0031	-.0283	0	0	0
30	2	.1442	.0290	-.0670	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
30	3	-.1375	-.0203	-.0260	.0917	.0407	-.0201	8.	.2100	0.0000	0.0000	0.0000	0	0	0
100	1	-.0440	.0106	.0010	.2324	.1036	-.0568	7.	.2960	.1276	-.0835	-.0254	0	0	0
100	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
100	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1200	1	.1222	.0030	.0240	-.1772	-.1098	.1812	18.	.8770	0.0000	0.0000	0.0000	0	0	0
1200	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1200	3	.2466	-.0272	-.0250	-.1789	.0622	.1494	20.	.7930	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		....	WIND ST DEV ....CM/SEC....	....	....	......	REYNOLDS STRESSES ....DYNES/CM2....	......							
50467															
1230	1	271.62	109.46	70.82	30.12	-.824	1.059	0.000	279.93	.020	.139	.222	.261	0.000	0.000
1230	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1230	3	281.22	118.17	64.22	30.81	-.447	1.290	0.000	284.87	-.025	.155	.309	.265	0.000	0.000
1330	1	260.99	117.02	85.76	25.74	-.576	2.368	0.000	273.30	.009	.109	.235	.309	0.000	0.000
1330	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1330	3	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1400	1	289.12	97.53	73.65	32.05	-.808	.229	0.000	297.77	.014	.120	.178	.252	0.000	0.000
1400	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1400	3	280.72	98.93	71.41	31.80	-.697	-.320	0.000	286.87	-.020	.127	.219	.260	0.000	0.000
1430	1	303.78	87.72	83.25	33.58	-.890	.077	0.000	314.30	.014	.120	.106	.261	0.000	0.000
1430	2	380.95	102.22	104.50	41.20	-1.309	-4.365	0.000	396.51	.035	.117	.086	.270	0.000	0.000
1430	3	312.25	96.84	89.64	34.03	-.929	-.111	0.000	321.88	-.013	.119	.088	.280	0.000	0.000
1500	1	340.74	90.69	87.50	36.26	-1.035	.615	0.000	351.08	.011	.112	.166	.244	0.000	0.000
1500	2	435.77	108.52	104.44	46.22	-1.685	-4.494	0.000	450.04	.025	.117	.072	.243	0.000	0.000
1500	3	362.14	94.45	85.27	36.50	-1.002	.536	0.000	369.11	-.023	.107	.179	.234	0.000	0.000
1530	1	371.69	95.85	75.50	39.41	-1.268	.318	0.000	379.03	.008	.111	-.038	.200	0.000	0.000
1530	2	486.15	103.48	67.30	41.28	-1.103	-2.908	0.000	492.18	.035	.090	-.157	.145	0.000	0.000
1530	3	382.52	95.14	77.57	39.92	-1.277	.230	0.000	388.72	-.018	.110	-.002	.200	0.000	0.000
1600	1	419.19	101.68	76.59	42.85	-1.688	.802	0.000	425.77	.003	.108	-.237	.178	0.000	0.000
1600	2	546.56	92.68	62.53	43.58	-1.151	-.824	0.000	553.61	.036	.081	-.320	.111	0.000	0.000
1600	3	450.94	91.84	80.50	43.81	-1.423	-.376	0.000	454.81	-.011	.102	-.223	.176	0.000	0.000
1630	1	426.29	100.66	79.87	44.46	-1.572	1.049	0.000	433.38	.003	.109	-.135	.183	0.000	0.000
1630	2	544.95	103.42	56.01	45.37	-1.303	-1.411	0.000	549.63	.037	.083	-.256	.095	0.000	0.000
1630	3	436.83	93.06	84.55	43.31	-1.401	.097	0.000	442.32	-.014	.103	-.158	.187	0.000	0.000
1700	1	444.67	105.99	68.17	44.79	-1.622	-.856	0.000	449.59	.001	.107	-.249	.153	0.000	0.000
1700	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1700	3	478.94	101.87	76.18	46.76	-1.648	-1.351	0.000	481.75	-.010	.104	-.222	.158	0.000	0.000
1730	1	439.96	111.92	66.30	45.39	-1.742	.084	0.000	444.56	.001	.043	-.280	.148	0.000	0.000
.730	2	580.67	105.30	61.95	46.24	-1.114	-2.636	0.000	588.72	.037	.081	-.367	.103	0.000	0.000
1730	3	471.42	107.36	72.68	45.99	-1.536	-1.489	0.000	472.69	-.008	.102	-.279	.151	0.000	0.000
1800	1	398.85	99.63	55.25	40.28	-1.404	-.313	0.000	402.29	0.000	.107	-.300	.136	0.000	0.000
1800	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1800	3	430.83	95.96	60.06	42.51	-1.389	-.918	0.000	430.87	-.007	.104	-.303	.140	0.000	0.000
1830	1	337.57	85.04	43.71	35.44	-1.018	-.378	0.000	340.08	.001	.110	-.313	.127	0.000	0.000
1830	2	443.85	80.92	49.76	32.31	-.248	-2.139	0.000	449.23	.035	.073	-.309	.107	0.000	0.000
1830	3	351.62	81.34	44.24	34.83	-.925	-.635	0.000	350.75	-.007	.104	-.324	.128	0.000	0.000
1900	1	275.16	66.77	42.64	29.38	-.685	-.563	0.000	278.31	.005	.111	-.181	.155	0.000	0.000
1900	2	382.96	67.78	41.64	31.11	-.068	-2.282	0.000	385.96	.034	.080	-.192	.102	0.000	0.000
1900	3	285.83	67.99	44.17	29.51	-.655	-.577	0.000	287.79	-.010	.107	-.168	.152	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER THOUSAND	F	G
50467															
1230	1	.2403	.0072	.0160	-.5444	-.0528	.1796	19.	.8670	0.0000	0.0000	0.0000	0	0	0
1230	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1230	3	.3258	-.0304	-.0280	-.0568	-.0135	.1524	20.	.7770	0.0000	0.0000	0.0000	0	0	0
1330	1	.2675	.0025	.0330	-1.2067	-.1970	.1689	19.	.7350	0.0000	0.0000	0.0000	0	0	0
1330	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1330	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1400	1	.1829	.0049	.0190	-.2863	.0337	.1115	19.	.6700	0.0000	0.0000	0.0000	0	0	0
1400	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1400	3	.2107	-.0287	-.0360	-.1149	.0539	.1157	20.	.6730	0.0000	0.0000	0.0000	0	0	0
1430	1	.1042	.0045	.0220	-.2127	.0407	.1071	19.	.5220	0.0000	0.0000	0.0000	0	0	0
1430	2	.0566	.0277	-.0080	-.2209	.1018	.1100	19.	.4840	0.0000	0.0000	0.0000	0	0	0
1430	3	.0872	-.0238	-.0240	-.1083	.0974	.1068	21.	.5130	0.0000	0.0000	0.0000	0	0	0
1500	1	.1694	.0033	.0260	-.2491	-.0047	.0877	19.	.4170	0.0000	0.0000	0.0000	0	0	0
1500	2	.0521	.0184	-.0300	-.2052	.0551	.1162	19.	.3340	0.0000	0.0000	0.0000	0	0	0
1500	3	.1795	-.0314	-.0260	-.2661	-.0453	.0788	20.	.3960	0.0000	0.0000	0.0000	0	0	0
1530	1	-.0377	.0004	.0170	-.2741	.0136	.0602	19.	.3410	0.0000	0.0000	0.0000	0	0	0
1530	2	-.1704	.0305	.1060	-.2871	.1268	.0708	19.	.3180	0.0000	0.0000	0.0000	0	0	0
1530	3	-.0001	-.0265	-.0200	-.2342	.0046	.0598	20.	.2900	0.0000	0.0000	0.0000	0	0	0
1600	1	-.2337	-.0049	.0340	-.1887	.0172	.0466	18.	.2440	0.0000	0.0000	0.0000	0	0	0
1600	2	-.3264	.0325	.1390	-.1384	.0414	.0354	18.	.2970	0.0000	0.0000	0.0000	0	0	0
1600	3	-.2242	-.0185	-.0140	-.1300	-.0066	.0354	19.	.3270	0.0000	0.0000	0.0000	0	0	0
1630	1	-.1308	-.0043	.0380	-.1565	-.0207	.0243	17.	.2420	0.0000	0.0000	0.0000	0	0	0
1630	2	-.2624	.0332	.2830	-.1765	.0168	.0152	18.	.2810	0.0000	0.0000	0.0000	0	0	0
1630	3	-.1573	-.0214	-.0410	-.0891	-.0430	.0190	19.	.2050	0.0000	0.0000	0.0000	0	0	0
1700	1	-.2540	-.0066	.0460	-.1844	.0478	-.0083	16.	.3820	0.0000	0.0000	0.0000	0	0	0
1700	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1700	3	-.2262	-.0176	-.0160	-.1391	.0361	-.0064	18.	.4360	0.0000	0.0000	0.0000	0	0	0
1730	1	-.2807	-.0064	.0410	.1461	-.0140	-.0359	15.	.3600	0.0000	0.0000	0.0000	0	0	0
1730	2	-.3783	.0340	.1790	.0322	-.0471	-.0271	16.	.3640	0.0000	0.0000	0.0000	0	0	0
1730	3	-.2833	-.0146	-.0090	.1524	-.0594	-.0297	16.	.4130	0.0000	0.0000	0.0000	0	0	0
1800	1	-.3030	-.0075	.0880	.3176	-.0162	-.0606	14.	.4470	0.0000	0.0000	0.0000	0	0	0
1800	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1800	3	-.3060	-.0140	-.0260	.3548	-.0095	-.0496	15.	.4460	0.0000	0.0000	0.0000	0	0	0
1830	1	-.3171	-.0068	.1060	.4818	-.0513	-.0524	12.	.4680	0.0000	0.0000	0.0000	0	0	0
1830	2	-.3217	.0330	.1830	.3470	-.1347	-.0152	13.	.3820	0.0000	0.0000	0.0000	0	0	0
1830	3	-.3277	-.0141	-.0080	.3806	-.0611	-.0458	14.	.4720	0.0000	0.0000	0.0000	0	0	0
1900	1	-.1886	-.0025	.0610	.2890	-.0247	-.0540	11.	.4440	0.0000	0.0000	0.0000	0	0	0
1900	2	-.2062	.0304	.3040	.1695	-.0789	-.0308	12.	.3790	0.0000	0.0000	0.0000	0	0	0
1900	3	-.1734	-.0180	-.0130	.2298	-.0052	-.0441	12.	.4120	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		....	WIND ST DEV ....CM/SEC....	....		......	REYNOLDS STRESSES ...DYNES/CM2...	......							
50467															
1930	1	278.77	71.03	48.86	28.93	-.565	-1.028	0.000	282.81	-.002	.107	-.186	.174	0.000	0.000
1930	2	373.40	65.37	45.55	30.98	-.138	-2.376	0.000	377.04	.039	.082	-.186	.120	0.000	0.000
1930	3	294.41	68.59	46.41	30.45	-.594	-.840	0.000	296.36	-.012	.106	-.151	.156	0.000	0.000
2000	1	292.97	71.25	43.91	31.21	-.679	-.746	0.000	296.05	0.000	.111	-.235	.149	0.000	0.000
2000	2	398.31	72.16	43.82	33.65	-.076	-2.297	0.000	401.76	.040	.082	-.227	.133	0.000	0.000
2000	3	291.21	62.38	43.66	30.29	-.630	-.165	0.000	292.42	-.010	.107	-.240	.149	0.000	0.000
2030	1	335.65	78.57	47.38	34.99	-.975	-.808	0.000	338.74	0.000	.110	-.291	.141	0.000	0.000
2030	2	444.08	78.42	50.69	34.87	-.458	-2.239	0.000	449.32	.037	.079	-.295	.109	0.000	0.000
2030	3	345.56	75.73	49.74	34.99	-.888	-.635	0.000	346.11	-.008	.106	-.282	.144	0.000	0.000
50567															
735	1	231.23	60.86	48.58	25.15	-.501	-.757	0.000	236.36	-.004	.119	-.169	.221	0.000	0.000
735	2	288.51	62.72	49.68	28.85	-.251	-.680	0.000	294.10	.016	.106	-.186	.178	0.000	0.000
735	3	235.93	59.43	42.14	25.71	-.590	-.289	0.000	242.48	-.003	.117	.003	.260	0.000	0.000
800	1	196.85	64.81	60.36	23.06	-.446	-.892	0.000	205.64	.004	.131	-.167	.304	0.000	0.000
800	2	238.85	63.97	65.39	29.38	-.223	-1.586	0.000	249.28	.034	.131	-.155	.274	0.000	0.000
800	3	215.24	68.93	65.72	23.20	-.442	-.719	0.000	222.92	-.008	.131	.079	.298	0.000	0.000
830	1	248.65	115.80	90.76	28.03	-.550	6.682	0.000	264.78	0.000	.122	.062	.382	0.000	0.000
830	2	301.98	134.01	107.88	35.55	-.483	9.150	0.000	322.44	.019	.131	.066	.346	0.000	0.000
830	3	236.69	112.41	77.23	28.05	-.692	-.318	0.000	246.41	-.010	.134	.032	.337	0.000	0.000
830	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
830	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
900	3	355.22	78.60	79.27	37.03	-.978	.287	0.000	361.70	-.020	.109	.129	.218	0.000	0.000
900	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
900	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
930	3	392.99	87.44	77.62	39.81	-1.151	.152	0.000	398.43	-.020	.106	.124	.192	0.000	0.000
930	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
930	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1000	3	424.69	91.90	76.17	42.20	-1.470	.942	0.000	427.30	-.022	.107	.261	.173	0.000	0.000
1000	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1000	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1030	3	429.63	98.58	90.39	44.14	-1.536	1.192	0.000	435.50	-.018	.109	.219	.210	0.000	0.000
1100	1	386.59	106.08	67.72	41.30	-1.457	.868	0.000	396.04	.004	.111	-.097	.223	0.000	0.000
1100	2	500.71	110.56	99.95	43.87	-1.183	2.199	0.000	511.66	.019	.052	-.085	.155	0.000	0.000
1100	3	397.34	110.74	96.31	40.71	-1.185	.393	0.000	404.93	-.015	.108	-.115	.222	0.000	0.000
1130	1	349.75	98.94	104.04	37.96	-1.105	3.036	0.000	364.54	.003	.113	-.068	.291	0.000	0.000
1130	2	447.69	101.07	122.33	42.56	-1.129	5.119	0.000	466.52	.023	.095	-.080	.267	0.000	0.000
1130	3	366.45	98.44	103.55	17.38	-2.342	-.726	0.000	374.83	-.015	.112	-.102	.267	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSU PARTS PER THOUSAND	F	G
50467															
1930	1	-.1969	-.2094	.0590	.2861	-.0306	-.0439	11.	.3550	0.0000	0.0000	0.0000	0	0	0
1930	2	-.2028	.0357	.1660	.1371	-.0540	-.0303	11.	.2330	0.0000	0.0000	0.0000	0	0	0
1930	3	-.1988	-.0152	.0040	.2653	-.0131	-.0404	12.	.3400	0.0000	0.0000	0.0000	0	0	0
2000	1	-.2473	-.0082	.0680	.3276	-.0702	-.0472	10.	.3590	0.0000	0.0000	0.0000	0	0	0
2000	2	-.2413	.0370	.3170	.2676	-.1371	-.0148	11.	.3570	0.0000	0.0000	0.0000	0	0	0
2000	3	-.2410	-.0157	-.0110	.2601	-.0365	-.0407	11.	.3540	0.0000	0.0000	0.0000	0	0	0
2030	1	-.2965	-.0080	.0710	.2233	-.0053	-.0512	10.	.2520	0.0000	0.0000	0.0000	0	0	0
2030	2	-.3002	.0338	.2140	.1873	-.0486	-.0439	10.	.2470	0.0000	0.0000	0.0000	0	0	0
2030	3	-.2858	-.0156	-.0230	.2260	.0228	-.0447	11.	.2750	0.0000	0.0000	0.0000	0	0	0
50567															
735	1	-.1822	-.0146	.0480	-.3127	.1328	.1196	13.	1.4560	0.0000	0.0000	0.0000	0	0	0
735	2	-.3960	.0140	.0700	-.0161	-.0808	.0760	13.	1.3680	0.0000	0.0000	0.0000	0	0	0
735	3	-.0023	-.0137	-.0430	-.2882	-.1294	.1118	14.	.5900	0.0000	0.0000	0.0000	0	0	0
800	1	-.1816	-.0076	.0260	-.0935	-.0230	.0908	13.	.5680	0.0000	0.0000	0.0000	0	0	0
800	2	-.1861	.0245	-.0520	-.0141	-.0264	.0950	13.	.3850	0.0000	0.0000	0.0000	0	0	0
800	3	.0647	-.01[illegible]	-.0280	-.2021	.0050	.1079	[illegible]	.5490	0.0000	0.0000	0.0000	0	0	0
830	1	.1536	-.0047	.0200	.1240	.1189	.0395	13.	.2610	0.0000	0.0000	0.0000	0	0	0
830	2	.1501	.0100	-.0520	.2042	.1297	.0423	13.	.2500	0.0000	0.0000	0.0000	0	0	0
830	3	.0138	-.0201	-.0920	-.2161	-.0922	.0389	14.	.3060	0.0000	0.0000	0.0000	0	0	0
830	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
830	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
900	3	.1284	-.0281	-.0060	-.1360	.0331	.0578	14.	.2200	0.0000	0.0000	0.0000	0	0	0
900	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
900	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
930	3	.1243	-.0273	-.0280	-.2621	.0620	.0623	15.	.2890	0.0000	0.0000	0.0000	0	0	0
930	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
930	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1000	3	.2637	-.0303	-.0180	-.3216	.0263	.1054	15.	.3920	0.0000	0.0000	0.0000	0	0	0
1000	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1000	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1030	3	.2222	-.0265	-.0200	-.5607	.0460	.1586	16.	.6070	0.0000	0.0000	0.0000	0	0	0
1100	1	-.0925	-.0040	.0230	-.3158	.0171	.1131	14.	.4260	0.0000	0.0000	0.0000	0	0	0
1100	2	-.0787	.0153	-.0400	-.2389	-.0512	.1050	14.	.3820	0.0000	0.0000	0.0000	0	0	0
1100	3	-.1121	-.0212	-.0420	-.3587	-.0242	.0935	16.	.4340	0.0000	0.0000	0.0000	0	0	0
1130	1	-.0438	-.0049	.0160	-.2301	.1079	.1069	14.	.4770	0.0000	0.0000	0.0000	0	0	0
1130	2	-.0575	.0188	-.0300	-.1140	.0843	.1062	14.	.3340	0.0000	0.0000	0.0000	0	0	0
1130	3	-.0836	.0492	.2010	-.2617	.1102	.1025	-7.35	.8090	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND	F ELEV	FSD ANGLE	G AZIM	GSD ANGLE	WIND DIR	WIND SHIFT
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC..........				......DYNES/CM2......			CM/SEC	RAD	RAD	RAD	RAD	RAD	RAD
91168															
30	1	107.08	39.07	33.35	18.59	-.260	-.004	.067	112.28	.026	.186	.015	.322	5.774	0.000
30	2	104.16	40.11	41.40	24.44	-.599	-.200	-.107	112.28	.071	.317	.040	.387	5.999	0.000
715	1	126.73	43.80	41.59	22.51	-.414	.037	.001	133.64	.043	.206	.014	.356	5.244	0.000
715	2	126.72	43.75	24.30	27.03	-.491	.061	.025	128.74	.055	.252	-.002	.149	5.728	1.872
740	1	144.91	46.15	48.65	25.47	-.539	-.038	.033	153.15	.036	.195	.012	.344	5.368	.121
740	2	144.91	56.59	34.74	30.19	-.759	.075	-.055	148.48	.048	.244	-.005	.158	5.731	.008
830	1	195.71	70.02	68.69	33.60	-.920	-1.154	.117	207.41	.037	.191	.023	.350	5.410	.053
830	2	195.69	75.83	47.04	41.33	-1.442	-.797	-.028	201.09	.050	.242	0.000	.188	5.750	.011
900	1	166.97	64.65	69.07	29.13	-.659	.117	.050	180.56	.042	.207	.027	.416	5.271	-.135
900	2	166.95	69.16	51.75	35.85	-1.007	.001	-.088	173.77	.061	.244	-.002	.202	5.602	-.145
1000	1	211.22	74.80	75.97	36.49	-1.049	-.091	.112	224.30	.036	.192	.036	.366	5.460	.319
1000	2	211.20	89.59	57.58	43.49	-1.647	-.341	.007	218.32	.056	.235	-.001	.195	5.774	-.035
1135	1	224.74	86.67	77.65	37.26	-1.095	-.471	.108	238.46	.034	.187	.034	.368	5.418	-.044
1135	2	218.19	87.27	60.44	37.40	-1.115	.019	-.073	226.29	.044	.251	.001	.287	5.742	-.036
1230	1	222.47	85.30	89.09	38.66	-1.158	-1.858	.098	240.66	.038	.190	.009	.417	5.336	-.108
1230	2	228.02	89.82	80.31	37.75	-1.191	-2.569	-.132	242.53	.042	.197	-.008	.379	5.645	-.087
1330	1	214.62	83.41	87.93	37.53	-1.032	-.312	.044	232.19	.045	.199	-.010	.413	5.055	-.299
1330	2	210.34	85.27	75.25	37.58	-1.407	-.810	.071	222.20	.064	.219	-.010	.325	5.355	-.288
1400	1	231.40	96.22	94.09	38.91	-1.153	-1.963	.052	249.46	.042	.200	-.007	.404	5.089	.037
1400	2	226.65	90.14	77.95	38.15	-1.334	-1.696	-.054	239.23	.051	.200	-.007	.340	5.408	.050
1430	1	146.59	96.59	79.02	29.87	-.875	-1.493	.146	167.70	.096	.277	-.017	.756	4.580	-.520
1430	2	185.09	72.89	71.84	31.34	-.841	-.877	.004	197.62	.039	.197	-.004	.361	5.088	-.323
1500	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1500	2	162.31	71.29	64.22	30.33	-.793	-1.363	-.096	173.53	.057	.227	-.005	.366	5.136	.049
1535	1	181.97	78.40	54.63	30.47	-.765	-.096	-.060	189.95	.047	.209	-.097	.331	4.868	-.034
1535	2	183.06	70.43	54.48	30.18	-.783	-.043	-.062	190.23	.034	.200	-.006	.274	5.100	-.034
1605	1	160.88	72.94	56.21	28.89	-.699	-.456	-.003	169.96	.049	.214	-.080	.372	4.845	-.035
1605	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1640	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1640	2	138.17	63.35	42.14	25.18	-.556	-.092	-.020	143.71	.043	.219	-.008	.274	4.875	-.191
1840	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1840	2	68.35	30.89	20.09	13.30	-.103	-.127	-.023	70.98	.018	.194	.141	.287	5.074	.955
91268															
710	1	111.84	46.69	34.14	20.27	-.280	-.075	-.026	117.11	.039	.233	-.041	.348	4.327	.112
710	2	103.43	51.33	23.86	18.67	-.356	-.162	-.025	106.76	.095	.258	-.239	.392	3.870	.112
740	1	103.83	51.23	39.79	21.03	-.308	-.122	-.018	110.86	.067	.272	-.023	.401	4.392	.047
740	2	99.09	48.08	46.30	22.46	-.368	.014	-.031	108.62	.056	.286	.113	.449	4.128	-.094

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSO	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER 100,000		
91168															
30	1	.1740	.0073	0.0000	.0693	-.0077	-.0220	8.	.2190	0.0000	0.0000	0.0000	122	1377	2955
30	2	-.0050	.0227	0.0000	.0798	-.0062	-.0393	7.	.2290	0.0000	0.0000	0.0000	124	9739	18390
715	1	1.2355	.0163	0.0000	-.0925	-.0221	.0576	10.	.5940	0.0000	0.0000	0.0000	144	2347	4415
715	2	1.2838	.0156	0.0000	-.3865	.0118	.0536	9.	.5640	0.0000	0.0000	0.0000	452	9216	43429
740	1	-.1229	.0131	0.0000	-.1686	-.0018	.0781	11.	.6250	0.0000	0.0000	0.0000	44	1505	2826
740	2	-.0039	.0034	0.0000	-.2408	.0085	.0771	11.	.5590	0.0000	0.0000	0.0000	1392	10551	41401
830	1	-.0745	.0142	0.0000	-.3946	.0721	.1234	13.	.6200	0.0000	0.0000	0.0000	188	1499	1811
830	2	-.0202	.0108	0.0000	-.4164	-.0067	.1479	13.	.5930	-.3237	-.1598	.2631	400	8468	41551
900	1	.1504	.0123	0.0000	-.2895	-.1151	.1447	14.	.7290	0.0000	0.0000	0.0000	891	2822	4078
900	2	.1558	.0104	0.0000	-.4346	-.3602	.1796	14.	.7740	-.5514	.0169	.2814	1706	11186	48228
1000	1	-.0388	.0129	0.0000	-.4250	.0349	.1886	17.	.7500	0.0000	0.0000	0.0000	193	1588	2243
1000	2	.0336	.0177	0.0000	-.5811	.0415	.1913	16.	.7640	.4325	.2945	.2768	690	9273	42907
1135	1	.0389	.0107	0.0000	-.1093	-.0060	.0425	18.	.2600	0.0000	0.0000	0.0000	232	1462	2416
1135	2	.0311	.0078	0.0000	-.3589	-.0233	.1306	18.	.5740	.2958	.2009	.2876	665	1199	24523
1230	1	.0837	.0161	0.0000	-.3380	-.1081	.1929	20.	.6030	0.0000	0.0000	0.0000	250	1402	2235
1230	2	.0512	.0178	0.0000	-.3239	-.1512	.1749	21.	.7240	1.0575	-1.6744	.1849	140	297	20896
1330	1	.3016	.0224	0.0000	-.3974	-.0806	.1681	21.	.6660	0.0000	0.0000	0.0000	711	2076	3396
1330	2	.2757	.0241	0.0000	-.4865	-.0135	.1665	22.	.6800	-.1007	-.4971	.1916	1140	3847	29983
1400	1	-.0615	.0127	0.0000	-.2681	-.0943	.0972	21.	.5890	0.0000	0.0000	0.0000	1184	2661	5240
1400	2	-.0809	.0216	0.0000	-.2117	-.1808	.1042	22.	.6030	.1671	.0928	.1382	661	2420	24512
1430	1	.3008	.0214	0.0000	-.0501	-.0751	.0459	21.	.4860	0.0000	0.0000	0.0000	6275	10946	17270
1430	2	.3090	.0119	0.0000	-.0371	-.1194	.0352	22.	.4600	-1.1318	.6482	.1850	601	2315	25148
1500	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1500	2	-.0991	.0186	0.0000	-.2632	.0751	.0828	22.	.5710	.6339	-1.6433	.2042	1398	4140	29427
1535	1	-.1186	.0163	0.0000	-.1779	-.0174	.0325	21.	.3240	0.0000	0.0000	0.0000	1155	3336	9789
1535	2	.0375	.0058	0.0000	-.1780	.0094	.0425	22.	.3530	.0793	-.5245	.1774	318	2101	22840
1605	1	.0091	.0188	0.0000	.1178	.5649	-.0022	21.	.4400	0.0000	0.0000	0.0000	1123	3385	10065
1605	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1640	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1640	2	.1765	.0102	0.0000	.0090	-.0030	.0023	22.	.1200	-.6660	.1961	.1004	644	3569	28066
1840	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1840	2	-.9846	.0002	0.0000	.0622	-.0110	-.0288	18.	.4190	-.0900	.0004	.0027	561	2230	9667
91268															
710	1	-.6490	.0070	0.0000	-.0157	-.0396	.0341	13.	-1.0610	0.0000	0.0000	0.0000	889	4334	9791
710	2	-.2065	.0224	0.0000	-.0543	-.0207	.0307	14.	.4610	-.0068	.0188	.0100	5957	10328	18679
740	1	-.0889	.0135	0.0000	-.1215	.0216	.0476	14.	.4130	0.0000	0.0000	0.0000	2898	8340	14179
740	2	.0620	.0008	0.0000	-.0832	-.0153	.0499	15.	.3660	-.4152	-.1707	.0808	2700	9163	15479

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
			WIND ST DEV			REYNOLDS STRESSES									
		....	........CM/SEC....	....	....	.....(DYNES/CM2...	....	....							
91268															
810	1	93.96	51.80	37.23	19.13	-.249	-.378	-.018	101.08	.079	.296	-.040	.475	4.759	.383
810	2	87.55	51.97	44.24	20.49	-.232	-.848	-.123	96.99	.108	.325	.182	.490	5.121	.925
900	1	134.13	61.97	45.84	26.04	-.544	-.341	-.045	142.07	.058	.249	-.170	.388	5.010	.381
900	2	133.93	60.34	38.85	24.99	-.592	-.532	-.068	139.90	.081	.248	-.157	.366	5.310	.528
930	1	162.66	74.70	55.82	29.70	-.699	-.105	-.008	171.84	.055	.230	-.025	.364	4.956	-.198
930	2	150.35	77.63	56.94	30.35	-.921	-.612	-.134	166.38	.075	.261	.101	.388	5.382	-.186
1005	1	214.08	81.94	70.17	36.55	-1.057	-.139	-.124	225.65	.040	.198	.007	.345	4.879	-.110
1005	2	192.78	91.03	64.36	36.29	-1.110	-.577	-.153	202.80	.064	.258	.258	.337	5.409	-.131
1035	1	185.77	87.79	74.54	32.83	-.763	-.770	-.093	199.72	.044	.235	.105	.418	4.740	-.237
1035	2	152.98	98.11	96.01	33.62	-.966	-2.122	-.145	177.64	.106	.308	.165	.681	4.844	-.472
1105	1	196.15	96.60	73.35	34.51	-.916	-.479	-.216	209.34	.060	.239	.047	.404	4.788	.106
1105	2	180.21	102.31	64.64	33.15	-.923	-1.094	-.271	191.30	.100	.278	-.100	.439	4.567	-.012
1135	1	153.40	94.82	68.49	31.61	-.821	-.084	-.159	166.18	.079	.289	.162	.436	4.722	-.181
1135	2	138.59	93.78	69.03	30.73	-.810	-1.033	-.233	152.38	.119	.328	.089	.485	4.580	-.176
1205	1	137.38	108.69	60.44	29.08	-.616	.095	-.065	147.40	.162	.351	.212	.419	4.873	.100
1205	2	161.39	91.89	79.10	33.53	-1.017	-.529	-.145	177.36	.105	.298	.093	.464	4.589	-.422
1305	1	149.41	113.81	71.21	34.56	-.861	.547	-.161	210.97	.066	.277	.207	.365	4.426	-.422
1305	2	179.55	104.00	75.01	37.54	-1.230	-.120	-.010	192.76	.097	.305	.291	.393	4.459	-1.141
1335	1	174.72	83.03	65.31	32.56	-.675	.518	-.165	185.77	.024	.240	.018	.381	4.222	-.014
1335	2	160.22	86.53	68.28	33.36	-.873	-.455	-.158	172.78	.058	.281	.109	.410	4.320	.002
1430	1	201.76	86.17	61.11	34.34	-.911	.312	-.083	210.59	.018	.208	.024	.309	4.111	-.118
1430	2	197.76	87.24	63.35	34.95	-1.242	-.193	-.006	207.39	.026	.226	.145	.323	4.232	-.123
1500	1	168.70	76.69	64.25	31.47	-.695	.240	-.023	179.84	.035	.234	.026	.375	4.201	.089
1500	2	157.89	79.07	65.49	31.00	-.896	.022	-.011	169.72	.063	.263	.252	.390	4.392	.053
1530	1	144.24	72.53	51.35	28.03	-.605	.234	.013	157.85	.057	.262	.057	.372	4.155	-.078
1530	2	141.48	73.53	53.12	28.17	-.768	.271	-.075	150.59	.056	.265	.272	.367	4.355	-.057
1600	1	167.39	74.29	57.43	31.68	-.626	-.390	-.015	176.74	.031	.233	.028	.353	4.206	.080
1600	2	168.38	78.35	61.13	31.49	-.877	-.725	-.165	178.58	.031	.240	.185	.357	4.376	.108
1630	1	147.30	57.29	44.92	25.72	-.422	-.416	-.045	154.09	.014	.207	.014	.320	4.191	-.002
1630	2	133.03	55.63	47.95	26.12	-.643	-.271	-.091	141.09	.059	.250	.179	.355	4.336	-.034
1710	1	106.03	40.08	29.83	18.27	-.251	-.093	-.007	110.20	.008	.196	.009	.293	4.104	-.082
1710	2	95.61	42.89	29.14	10.28	-.234	-.391	-.028	99.67	.020	.244	.346	.292	4.367	-.136
1740	1	73.94	21.62	16.57	9.46	-.036	-.085	.030	75.66	-.020	.153	.009	.227	3.756	-.348
1740	2	70.92	24.20	14.85	8.80	-.036	.058	.043	72.42	.014	.199	.077	.210	3.972	-.126
1805	1	76.02	16.79	14.17	7.38	-.028	-.018	.003	77.34	-.025	.116	.005	.198	3.670	-.081
1805	2	78.53	13.99	14.65	6.35	-.017	-.045	-.002	79.89	-.023	.088	.052	.190	3.954	.007

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	AIR TEMP ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER 100.000	F	G
91268															
810	1	-.5043	.0085	0.0000	-.1189	-.0587	.0818	16.	.6680	0.0000	0.0000	0.0000	5758	11909	27059
810	2	-1.0694	.0207	0.0000	-.0625	-.1843	.0887	16.	.6380	-.9211	.8042	.0920	7775	16061	29[illegible]55
900	1	-.4253	.0227	0.0000	-.2101	-.0437	.1229	20.	-.4090	0.0000	0.0000	0.0000	1261	5640	16190
900	2	-.5937	.0312	0.0000	-.1825	-.0604	.1160	21.	.7080	-.2673	.0545	.1719	2242	6940	10661
930	1	.1867	.0172	0.0000	-.2629	.0165	.1372	21.	.6910	0.0000	0.0000	0.0000	2153	4688	9479
930	2	.1390	.0176	0.0000	-.3521	.0316	.1474	22.	.7180	-.4144	.0275	.2227	3417	7980	17139
1005	1	.1023	.0149	0.0000	-.3840	-.0889	.1647	20.	.6820	0.0000	0.0000	0.0000	362	1996	3429
1005	2	.0891	.0044	0.0000	-.3766	-.0230	.1464	22.	.6830	0.0000	0.0000	0.0000	4805	7851	19855
1035	1	.1951	.0064	0.0000	-.4288	-.0324	.1465	23.	.7170	0.0000	0.0000	0.0000	2114	5079	8763
1035	2	.2741	.0047	0.0000	-.5873	-.0243	.1442	24.	.7360	1.4050	-4.2056	.2685	9430	14768	26125
1105	1	-.1523	.0117	0.0000	-.3917	-.0738	.1670	24.	.7060	0.0000	0.0000	0.0000	3765	6197	12103
1105	2	-.0906	.0180	0.0000	-.4307	-.0877	.1509	24.	.7130	-.5743	-.0944	.2397	8026	11696	18339
1135	1	.1[illegible]63	.0057	0.0000	-.6614	-.0050	.1578	24.	.8340	0.0000	0.0000	0.0000	5663	10858	16346
1135	2	.0[illegible]75	.0053	0.0000	-.5387	.0031	.1493	25.	.8000	-.1859	-.0725	.2313	12375	17826	30444
1205	1	-.1661	.0071	0.0000	-.7367	-.0471	.0881	24.	.8170	0.0000	0.0000	0.0000	17811	24367	33407
1205	2	-.0912	.0111	0.0000	-.3943	.0465	.1312	25.	.7200	-.3246	-.2921	.2299	9015	13632	25252
1305	1	.4231	-.0107	0.0000	-.2796	.0488	.1239	25.	.6240	0.0000	0.0000	0.0000	7944	10484	15254
1305	2	1.1036	.0018	0.0000	-.3875	.1130	.1487	25.	.6580	-.5050	.2740	.1120	8508	15672	30045
1335	1	.0046	-.0136	0.0000	-.3382	.0214	.1240	25.	.6840	0.0000	0.0000	0.0000	1584	5005	8061
1335	2	-.0383	-.0001	0.0000	-.3658	.0435	.1457	25.	.7170	-.0970	-.1486	.1510	3120	9346	16356
1430	1	.1135	-.0091	0.0000	-.3143	.0329	.0978	15.	.4980	0.0000	0.0000	0.0000	785	2638	4498
1430	2	.1068	-.0125	0.0000	-.3842	.0121	.1175	26.	.5170	-.2694	-.1770	.1135	834	3926	9569
1500	1	-.0952	.0001	0.0000	-.2812	.0171	.0906	15.	.4870	0.0000	0.0000	0.0000	957	4173	7660
1500	2	-.0828	.0024	0.0000	-.3063	.0238	.0919	26.	.4680	-.1604	.2019	.1232	3864	7890	22456
1530	1	.0585	.0081	0.0000	-.2124	.0265	.0729	15.	.4310	0.0000	0.0000	0.0000	2892	7224	12557
1530	2	.0431	.0003	0.0000	-.2565	-.0154	.0740	26.	.4230	-.1770	.0552	.1002	2561	768[illegible]	20981
1600	1	-.1077	-.0042	0.0000	-.1246	.0208	.0413	15.	.2670	0.0000	0.0000	0.0000	1541	4244	8461
1600	2	-.1429	-.0069	0.0000	-.1605	.0318	.0418	25.	.2390	-.3016	-.0775	.1080	1025	4903	14892
1630	1	-.0194	-.0091	0.0000	-.0134	.0050	-.0027	15.	.2110	0.0000	0.0000	0.0000	437	2389	5899
1630	2	.0076	.0140	0.0000	-.0538	.0057	.0105	25.	.1490	-.3391	.1575	.1081	1230	6230	16049
1710	1	.0733	-.0142	0.0000	.1122	-.0465	-.0265	23.	.4200	0.0000	0.0000	0.0000	238	1889	5[illegible]4
1710	2	.0888	-.0127	0.0000	.1232	-.0430	-.0156	23.	.3450	-.7071	.4165	.0144	1366	4953	25[illegible]6
1740	1	.3343	-.0316	0.0000	.1403	-.0313	-.0111	21.	.5810	0.0000	0.0000	0.0000	854	1677	4647
1740	2	1.4649	-.0163	0.0000	-.0256	-.0422	-.0143	21.	.6070	.0504	-.3270	.1776	3357	4734	10711
1805	1	.0791	-.0314	0.0000	.0861	-.0235	-.0125	20.	-.1730	0.0000	0.0000	0.0000	34	478	1892
1805	2	-.0110	-.0257	0.0000	.0523	-.0440	-.0084	20.	.5270	.0401	-.0079	.0101	0	57	503

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND	F ELEV	FSD ANGLE	G AZIM	GSD ANGLE	WIND DIR	WIND SHIFT
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC..........				......DYNES/CM2......			CM/SEC	RAD	RAD	RAD	RAD	RAD	RAD
91368															
145	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
145	2	111.41	42.59	8.53	2.95	-.024	-.320	-.012	111.80	.001	.107	.187	.125	4.426	-.030
215	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
215	2	168.01	53.31	8.43	4.76	-.092	-.121	-.015	168.23	-.002	.044	.054	.062	4.349	.057
245	1	162.69	44.43	9.37	4.37	-.060	.051	0.000	162.91	0.000	.038	-.013	.057	4.334	.022
245	2	161.55	53.47	8.68	4.88	-.110	.001	-.013	161.75	.002	.042	-.001	.054	4.317	.022
315	1	146.87	32.50	7.19	3.28	-.052	-.024	-.009	147.03	-.002	.032	-.011	.050	4.328	-.008
315	2	142.60	34.10	6.47	3.45	-.068	-.018	-.012	142.73	-.001	.036	0.000	.049	4.314	-.004
335	1	167.12	41.34	8.65	4.79	-.087	0.000	-.012	167.32	-.001	.034	-.009	.050	4.351	.022
335	2	169.70	46.20	9.02	5.46	-.130	-.019	-.016	169.93	.002	.044	.001	.055	4.336	.021
415	1	178.36	52.70	11.26	5.46	-.116	.006	-.007	178.69	.001	.047	-.011	.069	4.333	-.017
415	2	174.49	49.66	9.68	5.34	-.121	-.068	-.013	174.75	.001	.042	.003	.059	4.335	-.003
445	1	186.68	48.58	9.55	5.27	-.115	-.066	-.008	186.90	-.002	.034	-.012	.049	4.305	-.027
445	2	187.48	52.51	9.99	5.58	-.134	-.032	-.011	187.73	.001	.038	.002	.052	4.312	-.021
515	1	180.80	59.68	11.10	5.57	-.108	.056	-.008	181.11	0.000	.044	-.010	.065	4.334	.027
515	2	173.91	58.86	9.90	5.53	-.119	-.054	-.012	174.18	0.000	.043	.004	.062	4.353	.039
545	1	132.19	38.64	8.06	3.43	-.055	-.009	-.010	132.42	0.000	.048	-.027	.078	4.304	-.012
545	2	132.94	45.35	7.90	4.16	-.081	-.064	-.010	133.17	.003	.068	.003	.087	4.348	-.005
615	1	139.56	47.53	8.61	4.04	-.070	-.086	-.010	139.81	-.002	.042	-.023	.068	4.257	-.051
615	2	130.49	45.10	7.93	4.16	-.079	-.113	-.012	130.74	.005	.073	.004	.093	4.300	-.049
630	1	213.14	67.49	14.09	7.12	-.160	-.126	-.013	213.59	0.000	.051	-.011	.077	4.300	.030
630	2	200.72	70.53	13.80	7.52	-.228	-.169	-.010	201.21	.006	.060	.004	.082	4.307	.007
705	1	240.37	83.52	24.75	8.66	-.239	-.092	-.026	241.51	.003	.059	-.005	.105	4.355	.049
705	2	231.58	89.85	19.64	8.54	-.301	-.187	-.015	232.37	.009	.073	.007	.106	4.338	.027
800	1	195.30	197.67	62.23	26.89	-1.319	7.389	-.317	211.70	.245	.370	.346	.664	5.162	.457
800	2	210.53	185.89	59.84	26.40	-1.313	-1.916	.114	212.77	.236	.364	.336	.179	4.535	-.131
835	1	225.68	228.40	69.50	26.41	-1.382	9.537	-.240	258.34	.205	.349	.172	.847	5.113	.124
835	2	248.37	200.86	50.18	26.98	-1.419	3.939	-.175	254.86	.201	.346	.170	.330	4.503	.134
905	1	283.57	143.25	56.35	21.04	-1.053	-2.228	.190	0.00	.012	.110	-.008	.128	4.383	-.554
905	2	281.60	109.26	55.24	20.37	-.989	.115	-.137	0.00	.016	.119	.024	.102	4.313	-.031
935	1	298.08	107.92	80.61	20.98	-.690	-1.297	-.166	0.00	.014	.121	-.002	.129	4.418	.032
935	2	298.15	110.63	64.19	21.32	-.972	-.936	-.108	0.00	.016	.131	.024	.112	4.343	.030
1005	1	325.96	110.61	75.12	23.12	-.926	-.632	-.013	0.00	.010	.112	-.002	.120	4.383	-.035
1005	2	327.48	112.00	75.40	23.50	-1.117	-.734	-.008	0.00	.014	.123	.016	.115	4.302	-.037
1040	1	328.96	115.14	77.58	22.62	-.862	-.035	.004	0.00	.010	.105	-.010	.119	4.316	-.064
1040	2	324.49	112.32	71.20	23.04	-1.056	-.602	.048	0.00	.010	.123	.018	.111	4.244	-.060

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER 100.000	F	G
91368															
145	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
145	2	-.0047	-.0116	0.0000	0.0000	0.0000	0.0000	13.	0.0000	0.0000	0.0000	0.0000	1709	1934	3054
215	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
215	2	-.0635	-.0053	0.0000	0.0000	0.0000	0.0000	13.	0.0000	0.0000	0.0000	0.0000	115	138	243
245	1	.8613	-.0028	0.0000	.0093	.0002	-.0012	13.	.0590	0.0000	0.0000	0.0000	91	108	140
245	2	-.0229	-.0021	0.0000	.0412	0.0000	-.0023	13.	.1160	0.0000	0.0000	0.0000	43	89	91
315	1	.0069	-.0040	0.0000	.0482	-.0013	-.0044	13.	.2230	0.0000	0.0000	0.0000	15	33	75
315	2	.0030	-.0036	0.0000	.0669	.0008	-.0050	13.	.2470	0.0000	0.0000	0.0000	20	42	51
335	1	-.0218	-.0041	0.0000	.0661	-.0023	-.0065	13.	.2180	0.0000	0.0000	0.0000	5	7	13
335	2	-.0222	-.0020	0.0000	.1030	0.0000	-.0091	13.	.2460	0.0000	0.0000	0.0000	46	70	81
415	1	.0162	-.0035	0.0000	.1380	-.0062	-.0098	13.	.3060	0.0000	0.0000	0.0000	110	157	211
415	2	.0001	-.0030	0.0000	.1444	-.0060	-.0091	13.	.3070	0.0000	0.0000	0.0000	59	67	83
445	1	.0260	-.0045	0.0000	.1595	-.0014	-.0110	12.	.3160	0.0000	0.0000	0.0000	7	12	23
445	2	.0202	-.0028	0.0000	.1735	.0023	-.0099	12.	.3180	0.0000	0.0000	0.0000	1	23	16
515	1	-.0266	-.0041	0.0000	.1885	-.0001	-.0105	13.	.3190	0.0000	0.0000	0.0000	86	115	182
515	2	-.0420	-.0037	0.0000	.1955	-.0024	-.0101	13.	.3290	0.0000	0.0000	0.0000	51	70	126
545	1	.0102	-.0040	0.0000	.0909	-.0009	-.0067	13.	.2980	0.0000	0.0000	0.0000	200	222	411
545	2	-.0027	-.0043	0.0000	.1311	-.0017	-.0072	13.	.3110	0.0000	0.0000	0.0000	428	562	636
615	1	.0469	-.0051	0.0000	.1048	-.0056	-.0025	13.	.2360	0.0000	0.0000	0.0000	90	112	225
615	2	.0390	-.0031	0.0000	.1291	-.0056	-.0028	13.	.2730	0.0000	0.0000	0.0000	588	688	863
630	1	-.0338	-.0043	0.0000	-.0005	-.0006	-.0006	13.	0.0000	0.0000	0.0000	0.0000	160	194	261
630	2	-.0124	-.0016	0.0000	-.0005	-.0006	-.0006	13.	0.0000	0.0000	0.0000	0.0000	119	236	302
705	1	-.0527	-.0033	0.0000	.0167	-.0807	-.0015	10.	1.2130	0.0000	0.0000	0.0000	252	326	379
705	2	-.0364	-.0014	0.0000	-.3277	.0054	.0061	10.	1.3180	0.0000	0.0000	0.0000	421	577	745
800	1	-.1247	.0096	0.0000	2.5939	.4831	-.0647	18.	.9200	0.0000	0.0000	0.0000	29899	37941	47940
800	2	.0069	.0116	0.0000	-.1193	.0072	.0115	18.	.2480	-4.7429	.3410	.2107	27992	35931	43940
835	1	.3226	.0077	0.0000	-.9210	-.1674	.0286	17.	.3660	0.0000	0.0000	0.0000	24789	31382	33373
835	2	-.1856	.0081	0.0000	-2.4914	-.3525	.0734	18.	.8660	-8.8854	-1.1942	.2779	23894	30528	31573
905	1	1.1280	-.0002	0.0000	-.3512	.1073	.0430	22.	.4850	0.0000	0.0000	0.0000	210	257	292
905	2	.1013	-.0006	0.0000	-.4457	.0170	.0442	22.	.5080	-.8576	-.0233	.1358	200	280	302
935	1	-.1306	.0008	0.0000	-.3927	.0488	.0591	23.	.4720	0.0000	0.0000	0.0000	363	400	444
935	2	-.1316	-.0013	0.0000	-.4941	.0680	.0627	23.	.4800	-.5080	-.5206	.1422	351	450	480
1005	1	.1066	-.0019	0.0000	-.5009	.1565	.0706	23.	.5340	0.0000	0.0000	0.0000	230	284	294
1005	2	.1078	-.0016	0.0000	-.5128	.1617	.0723	23.	.5130	-.2844	-.7560	.1168	320	375	394
1040	1	.2126	-.0006	0.0000	-.5513	.1579	.0721	21.	.5650	0.0000	0.0000	0.0000	157	210	243
1040	2	.1832	-.0056	0.0000	-.5876	.2079	.0766	22.	.5740	-.3432	-.0745	.1336	313	375	392

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
			........CM/SEC	WIND ST DEV	....	......DYNES/CM2	REYNOLDS STRESSES	....							
91368															
1130	1	328.19	110.35	96.35	22.72	-.936	2.755	-.094	0.00	.012	.105	0.000	.146	4.279	-.041
1130	2	334.92	112.62	85.52	23.24	-1.148	.906	.083	0.00	.008	.111	.018	.128	4.192	-.051
1200	1	347.58	122.21	87.66	24.78	-.998	-.368	-.217	0.00	.016	.125	.062	.129	4.352	.072
1200	2	365.74	124.84	79.75	25.70	-1.330	-.864	-.193	0.00	.018	.126	.022	.121	4.273	.078
1300	1	299.42	106.37	83.14	46.80	-1.564	.007	-.126	310.63	.010	.174	.010	.280	4.212	-.049
1300	2	283.05	108.86	85.72	48.27	-2.133	-1.057	-.030	295.51	.028	.202	.046	.306	4.235	-.073
1330	1	307.75	112.05	86.83	48.58	-1.771	.177	-.142	319.59	.012	.173	.014	.284	4.358	.042
1330	2	300.92	122.62	89.05	51.28	-2.787	-1.383	.166	313.66	.028	.203	.057	.305	4.282	.035
1400	1	268.82	99.76	75.59	43.52	-1.53[illegible]	-.413	-.020	279.04	.019	.188	.010	.293	4.403	.048
1400	2	263.23	97.85	79.09	45.12	-2.[illegible]55	-1.797	.253	274.65	.035	.204	.053	.304	4.355	.078
1430	1	247.47	85.24	67.51	37.96	-1.135	-.182	-.032	256.55	.009	.173	-.003	.280	4.222	-.168
1430	2	249.57	89.47	69.09	40.22	-1.545	-.656	.172	258.94	.018	.190	.032	.285	4.162	-.172
1505	1	233.85	82.32	65.37	37.25	-1.093	.051	-.122	242.62	.014	.177	-.011	.279	4.262	.047
1505	2	235.01	90.45	64.48	37.73	-1.307	-.[illegible]32	.084	243.69	.027	.194	.030	.285	4.224	.064
1535	1	266.63	98.84	70.79	42.59	-1.360	.11[illegible]	-.113	275.79	.019	.178	.009	.271	4.311	.030
1535	2	2[illegible].71	104.68	74.67	43.58	-1.835	-.685	-.294	275.80	.025	.198	.041	.289	4.296	.061
1605	1	267.50	104.46	78.75	42.24	-1.344	.941	-.096	278.26	.009	.178	-.003	.288	4.338	.039
1605	2	269.10	111.75	78.44	43.50	-1.7[illegible]7	.258	-.857	279.86	.025	.187	.044	.291	4.338	.039
1635	1	185.12	74.83	50.77	29.79	-.765	-.036	-.050	191.71	.015	.181	-.024	.278	4.285	-.033
1635	2	180.59	70.46	47.79	29.47	-.757	-.546	-.405	186.66	.024	.185	.030	.268	4.316	-.008
1705	1	151.00	67.04	40.58	24.82	-.467	-.194	-.017	156.15	.013	.190	.004	.277	4.215	.319
1705	2	149.04	67.67	40.38	24.85	-.514	.058	-.225	154.41	.021	.187	.035	.282	4.250	-.071
1735	1	104.57	54.30	33.27	18.46	-.200	-.678	-.007	109.27	.014	.202	.026	.333	4.093	-.138
1735	2	108.18	50.43	28.81	16.29	-.174	-.510	-.134	111.56	.006	.161	.012	.260	4.164	-.063
1805	1	100.55	29.24	24.41	14.51	-.144	-.078	-.015	103.50	-.005	.160	.005	.252	4.142	.070
1805	2	101.48	30.47	23.04	14.34	-.157	-.119	-.090	104.06	.006	.152	.016	.230	4.214	.046
1905	1	121.03	46.33	30.91	18.67	-.236	-.008	0.000	124.82	0.000	.165	.011	.259	4.305	.157
1905	2	126.65	46.23	32.75	19.76	-.280	-.252	-.179	130.71	.016	.176	.036	.260	4.357	.123
1935	1	89.72	33.97	22.79	13.53	-.136	-.086	.011	92.57	-.003	.174	.011	.268	4.255	-.050
1935	2	94.34	33.23	23.21	13.56	-.126	-.220	-.095	97.12	.004	.156	.013	.253	4.321	-.013
2005	1	74.75	22.46	17.96	8.95	-.055	-.033	-.009	77.00	-.013	.134	.015	.264	4.269	.009
2005	2	82.87	24.48	17.76	10.01	-.075	-.104	-.048	84.73	-.010	.118	.022	.217	4.349	.019
2035	1	59.08	44.35	18.38	10.25	-.050	.020	-.004	61.53	.145	.335	.152	.450	4.505	.100
2035	2	63.37	39.27	17.67	10.41	-.069	-.035	-.043	65.81	.014	.225	.061	.367	4.402	.015
2110	1	71.16	51.70	21.11	12.46	-.110	.255	-.025	74.33	.129	.342	.193	.416	4.711	.166
2110	2	103.31	34.37	22.54	13.59	-.125	-.174	-.076	105.66	-.001	.141	.006	.225	4.351	.003

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSG	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER 100,000		
91368															
1130	1	.1608	.0001	0.0000	-.4792	.1052	.0777	22.	.5450	0.0000	0.0000	0.0000	200	242	240
1130	2	.1760	-.0056	0.0000	-.5218	.0863	.0804	23.	.5230	-.2474	.4229	.1062	228	263	292
1200	1	-.2538	.0004	0.0000	-.6655	.0623	.0688	22.	.5920	0.0000	0.0000	0.0000	368	419	451
1200	2	-.2862	.0006	0.0000	-.6584	.0938	.0809	23.	.5520	-.4945	-.1340	.1026	340	418	441
1300	1	.0490	-.0081	0.0000	-.5304	.0634	.1746	26.	.6080	0.0000	0.0000	0.0000	103	711	1432
1300	2	.0569	-.0018	0.0000	-.6034	.0748	.1650	27.	.5890	-.2388	-.0608	.1265	611	2246	4828
1330	1	-.0434	-.0068	0.0000	-.5222	.0607	.1501	26.	.5540	0.0000	0.0000	0.0000	143	686	1641
1330	2	-.0515	-.0043	0.0000	-.5993	.1352	.1596	27.	.5120	-.0699	.0437	.1178	402	2271	5063
1400	1	-.0625	-.0060	0.0000	-.2528	.0194	.0952	26.	.6300	0.0000	0.0000	0.0000	669	1510	2980
1400	2	-.1057	.0036	0.0000	-.3012	.0819	.0822	26.	.5810	-.1666	.0626	.1033	365	2390	5778
1430	1	.1647	-.0093	0.0000	-.0607	.0099	.0216	25.	.3170	0.0000	0.0000	0.0000	95	713	1776
1430	2	.1608	-.0076	0.0000	-.0297	-.0125	.0150	26.	.2800	-.4287	-.0353	.1243	233	1753	3598
1505	1	-.0452	-.0050	0.0000	-.2257	-.0089	.0761	26.	.3400	0.0000	0.0000	0.0000	34	876	2064
1505	2	-.0813	-.0030	0.0000	-.2580	-.0070	.0431	26.	.3110	.0060	.0635	.0899	279	2135	4044
1535	1	-.0322	-.0053	0.0000	-.2567	.0004	.0606	26.	.3050	0.0000	0.0000	0.0000	181	891	1746
1535	2	-.0748	-.0052	0.0000	-.2977	.0113	.0618	27.	.2840	-.4015	.0710	.1016	676	2287	4546
1605	1	-.0331	-.0109	0.0000	-.1894	.0201	.0314	25.	.3730	0.0000	0.0000	0.0000	184	963	2357
1605	2	-.0438	.0004	0.0000	-.3184	-.0050	.0449	26.	.3600	.5319	.1868	.0944	364	1528	4065
1635	1	.0267	-.0054	0.0000	.2708	-.0201	-.0399	25.	.4910	0.0000	0.0000	0.0000	123	1135	3657
1635	2	-.0089	.0037	0.0000	.2389	-.0267	-.0316	25.	.4150	-.9035	.1466	.0985	169	1555	4230
1705	1	.0884	-.0076	0.0000	.4519	-.0791	-.0355	24.	.5980	0.0000	0.0000	0.0000	282	1815	4528
1705	2	.0535	0.0000	0.0000	.4159	-.0273	-.0301	24.	.5490	-2.5699	.1667	.0285	207	1799	5078
1735	1	.0812	-.0082	0.0000	.4946	-.1347	-.0254	22.	-2.4070	0.0000	0.0000	0.0000	1309	2911	8761
1735	2	.0292	-.0077	0.0000	.4554	-.0724	-.0252	23.	.6840	-1.8021	.3190	.0212	509	1288	3524
1805	1	-.0772	-.0184	0.0000	.1081	-.0050	-.0273	20.	.4870	0.0000	0.0000	0.0000	97	938	3158
1805	2	-.0550	-.0061	0.0000	.1341	-.0082	-.0327	19.	.5620	-.0628	.0206	.0254	76	691	2061
1905	1	-.1607	-.0148	0.0000	.2800	.0091	-.0450	19.	.5750	0.0000	0.0000	0.0000	130	929	3095
1905	2	-.1388	-.0002	0.0000	.2487	-.0036	-.0389	18.	.5170	-.2047	.0028	.0164	219	1447	3826
1935	1	.0405	-.0194	0.0000	.1066	-.0169	-.0385	19.	.5560	0.0000	0.0000	0.0000	261	1741	5341
1935	2	-.0050	-.0069	0.0000	.1060	-.0189	-.0277	18.	.5290	.0705	.0286	.0110	181	1017	3604
2005	1	-.0147	-.0217	0.0000	.0826	-.0194	-.0137	18.	.5010	0.0000	0.0000	0.0000	200	724	6080
2005	2	-.0258	-.0168	0.0000	.0990	-.0246	-.0185	17.	.5080	-.0257	-.0009	.0118	0	199	1927
2035	1	0.0000	-.0130	0.0000	.3560	.0188	-.0156	17.	.7230	0.0000	0.0000	0.0000	0	0	0
2035	2	-.0071	-.0078	0.0000	.3313	.0257	-.0162	17.	.6750	-.6308	-.0677	.0219	2981	5636	12990
2110	1	.0120	-.0142	0.0000	.4530	.0116	-.0244	17.	.8470	0.0000	0.0000	0.0000	15579	22110	27972
2110	2	-.0180	-.0103	0.0000	.3229	-.0463	-.0233	18.	-.2870	-.2764	.0671	.0094	83	718	2198

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		........CM/SEC	WIND ST DEV	....		REYNOLDS STRESSES	......DYNES/CM2	....							
91368															
2140	1	147.10	48.42	36.73	22.55	-.358	-.055	-.045	151.55	-.001	.164	.005	.251	4.328	-.196
2140	2	150.20	47.09	33.42	22.25	-.435	-.144	-.187	153.93	.013	.165	.019	.229	4.396	.032
2210	1	142.08	50.31	36.63	24.02	-.450	-.019	-.012	146.83	.017	.187	.008	.269	4.339	.007
2210	2	149.76	55.95	35.57	23.43	-.482	-.255	-.193	153.99	.014	.178	.032	.251	4.394	0.000
91469															
	1	147.67	55.41	38.61	24.01	-.465	-.090	.002	152.80	.008	.189	.015	.280	4.442	0.000
	2	149.07	56.86	39.17	24.95	-.516	-.155	-.277	154.28	.016	.195	.038	.281	4.506	.108
30	1	119.08	42.68	30.85	19.59	-.271	-.154	-.005	123.16	.013	.185	.016	.278	4.439	-.004
30	2	115.25	47.98	32.03	19.64	-.286	-.311	-.168	119.70	.024	.202	.036	.299	4.520	.015
110	1	101.65	35.70	27.33	15.77	-.156	-.296	.038	113.89	-.004	.152	.005	.248	4.388	.053
110	2	105.09	36.15	25.26	15.72	-.179	-.285	-.092	111.11	.010	.166	.002	.249	4.482	.118
140	1	104.61	27.58	20.86	12.48	-.131	-.051	0.000	106.65	-.009	.128	-.008	.204	4.359	-.017
140	2	101.33	25.90	20.26	11.82	-.121	-.123	-.055	103.37	.002	.129	.003	.207	4.472	-.010
240	1	79.37	44.53	19.77	11.83	-.096	.162	-.061	81.85	.056	.275	.118	.335	4.613	-.080
240	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
335	1	123.65	36.93	28.27	18.05	-.268	-.020	-.022	126.84	-.002	.156	-.001	.234	4.391	-.218
335	2	119.23	36.56	25.58	17.07	-.242	-.072	-.112	122.09	.009	.165	.006	.233	4.503	.627
405	1	93.07	33.10	22.16	13.44	-.131	-.047	.002	96.42	-.001	.162	-.012	.256	4.398	.018
405	2	90.02	32.98	22.21	13.86	-.161	-.041	-.095	93.09	.008	.176	-.019	.274	4.514	.036
530	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
530	2	81.21	43.83	30.97	16.36	-.305	-.831	.007	96.09	.028	.211	-.001	.304	4.426	.516
600	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
600	2	161.01	56.20	39.98	26.36	-.588	-.339	-.195	166.14	.015	.192	.027	.264	4.451	-.003
630	1	131.19	48.37	38.31	23.96	-.455	.413	-.194	146.37	.009	.194	.002	.276	4.283	-.020
630	2	149.01	53.00	37.44	25.17	-.556	-.299	-.048	154.00	.015	.199	.023	.273	4.427	-.020
700	1	168.40	55.22	43.44	26.86	-.524	-.171	.002	174.16	.006	.183	.009	.275	4.264	-.025
700	2	164.26	58.11	45.59	27.69	-.732	-.132	-.059	170.55	.021	.201	.022	.290	4.411	-.014
730	1	206.01	74.59	53.62	33.47	-.798	-.281	.024	212.87	.009	.182	.006	.268	4.277	.015
730	2	208.94	76.76	53.00	34.80	-1.171	-.414	-.020	215.77	.022	.196	.030	.768	4.430	.011
800	1	256.13	87.93	64.39	38.70	-1.175	.101	-.010	264.30	.009	.171	-.011	.265	4.297	.037
800	2	246.18	90.18	62.07	40.12	-1.567	-.518	-.014	254.09	.024	.194	.044	.266	4.444	0.000
835	1	259.07	95.03	60.05	39.37	-1.246	-.104	.058	260.56	.015	.183	-.024	.276	4.324	.040
835	2	248.04	99.86	66.78	41.56	-1.744	-.376	-.110	251.59	.034	.199	.040	.284	4.447	.008
905	1	250.09	90.84	68.66	41.20	-1.346	-.228	.024	260.32	.021	.191	-.010	.287	4.360	.021
905	2	260.08	95.05	68.50	42.45	-1.685	-.701	-.074	270.00	.023	.193	.045	.272	4.486	.033
935	1	276.14	95.34	72.45	43.19	-1.454	-.387	-.002	285.70	.018	.178	.004	.274	4.376	.002
935	2	272.16	95.21	67.74	44.19	-1.902	-.526	-.068	280.85	.031	.190	.039	.264	4.478	-.003

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER 100,000		
91368															
2140	1	.1537	-.0149	0.0000	.2265	-.0077	-.0544	16.	.4680	0.0000	0.0000	0.0000	30	735	1972
2140	2	-.0404	-.0040	0.0000	.2150	-.0111	-.0542	17.	.4560	-.6254	.0184	.0035	55	915	1653
2210	1	-.0098	-.0033	0.0000	.2029	-.0029	-.0553	18.	.4130	0.0000	0.0000	0.0000	128	1460	3335
2210	2	.0062	-.0068	0.0000	.2923	-.0113	-.0517	17.	.4510	-.1982	.0137	.0212	83	1301	2658
91468															
	1	-.1050	-.0141	0.0000	.2536	-.0285	-.0639	17.	.4840	0.0000	0.0000	0.0000	275	1694	4104
	2	-.1215	-.0069	0.0000	.2370	-.0133	-.0521	16.	.4410	-.1788	.0554	.0165	225	1989	4947
30	1	-.0084	-.0054	0.0000	.1833	-.0223	-.0485	16.	.4980	0.0000	0.0000	0.0000	185	1673	5000
30	2	-.0412	.0024	0.0000	.2637	-.0386	-.0397	15.	.5240	-.1850	.0172	.0212	501	2833	6844
110	1	-.0779	-.0164	0.0000	.1743	-.0680	-.0404	15.	.6230	0.0000	0.0000	0.0000	138	729	2453
110	2	-.1391	-.0028	0.0000	.1693	-.0481	-.0314	15.	.5910	-.0395	.0339	.0216	111	1436	3326
140	1	.0156	-.0188	0.0000	.0952	-.0081	-.0285	14.	.5580	0.0000	0.0000	0.0000	46	399	1511
140	2	.0012	-.0079	0.0000	.0984	-.0130	-.0242	14.	.5040	.0121	.0114	.0129	35	404	1137
240	1	.1772	-.0131	0.0000	.1419	.0054	-.0205	14.	.4080	0.0000	0.0000	0.0000	6997	11557	16064
240	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
335	1	.3223	-.0165	0.0000	.1545	-.0031	-.0400	14.	.4000	0.0000	0.0000	0.0000	17	552	1820
335	2	-.6383	-.0074	0.0000	.1370	-.0051	-.0310	13.	.3480	-.0362	.0189	.0161	63	1078	2201
405	1	-.0023	-.0016	0.0000	.1023	-.0146	-.0274	14.	.4240	0.0000	0.0000	0.0000	524	1335	4463
405	2	-.0038	-.0007	0.0000	.1013	-.0093	-.0249	13.	0.0000	-.0081	.0117	.0148	128	1405	4625
530	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
530	2	-.0597	-.0007	0.0000	.1680	-.0722	-.0343	13.	0.0000	-.1877	.1045	.0256	838	3514	7957
600	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
600	2	-.0009	-.0008	0.0000	.1771	-.0037	-.0507	14.	.3630	-.1129	-.0128	.0417	192	1742	3142
630	1	.0392	-.0015	0.0000	.0054	.0055	-.0026	15.	.2240	0.0000	0.0000	0.0000	167	1553	4373
630	2	.0005	-.0009	0.0000	.0074	-.0025	-.0051	14.	.2030	-.0709	.0131	.0427	58	2140	4135
700	1	.0196	-.0133	0.0000	-.0073	.0143	.0251	16.	.3780	0.0000	0.0000	0.0000	75	1251	3409
700	2	.0054	-.0071	0.0000	-.0231	.0138	.0212	16.	.3270	-.3166	-.0192	.0790	203	2388	4294
730	1	-.0227	-.0095	0.0000	-.2628	.0133	.0245	17.	1.1200	0.0000	0.0000	0.0000	105	994	2453
730	2	-.0204	-.0040	0.0000	-.2708	.0090	.0303	16.	.9780	-1.1683	.1200	.0919	100	1918	3014
800	1	-.0396	-.0101	0.0000	-.2747	-.0487	.0605	21.	.4340	0.0000	0.0000	0.0000	328	902	2124
800	2	-.0110	-.0042	0.0000	-.2900	-.0268	.0558	20.	.4230	-.4698	.1453	.1595	367	1820	3309
835	1	-.0040	-.0005	0.0000	-.2926	.0526	.1114	23.	.4600	0.0000	0.0000	0.0000	229	1188	2620
835	2	-.0015	.0004	0.0000	-.2976	.0106	.1135	24.	.4270	-.8206	.0480	.2038	186	2027	3971
905	1	-.0026	-.0001	0.0000	-.4250	.0552	.1213	23.	.5140	0.0000	0.0000	0.0000	335	1491	2773
905	2	-.0043	-.0001	0.0000	-.4414	.0729	.1171	24.	.4890	-.4355	.0691	.1779	167	1531	2880
935	1	-.0089	-.0017	0.0000	-.3802	.0605	.1087	24.	.4570	0.0000	0.0000	0.0000	145	1005	2296
935	2	-.0054	.0049	0.0000	-.4227	.0368	.1177	25.	.4410	-.4996	-.0425	.2186	177	1578	2540

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		....	WIND ST DEV	...CM/SEC........		......REYNOLDS STRESSES	DYNES/CM2......								
91468															
1005	1	271.49	105.66	72.29	42.54	-1.529	.102	-.162	281.38	.024	.185	-.054	.289	4.350	.032
1005	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	-.010
1035	1	293.12	118.55	87.54	48.09	-1.886	.139	-.119	305.31	.022	.191	.003	.296	4.396	-.010
1035	2	317.74	160.20	129.14	52.99	-.698	8.728	-2.194	347.83	.056	.221	.104	.628	4.777	-.148
1105	1	308.12	113.64	85.52	48.92	-1.896	-.057	-.124	319.55	.019	.181	.008	.280	4.413	-.148
1105	2	364.23	124.72	108.51	54.93	-2.664	3.775	.529	380.60	.028	.163	.053	.312	4.679	.155
1200	1	292.70	119.18	89.66	47.20	-1.824	.454	-.257	305.19	.030	.191	.004	.302	4.324	.155
1200	2	357.41	127.95	104.60	55.16	-2.484	.528	-.094	371.69	.036	.176	.030	.294	4.508	-1.503
1230	1	297.79	117.13	87.11	48.60	-1.939	.410	-.104	309.71	.022	.132	.003	.289	4.354	.031
1230	2	354.89	133.43	104.83	56.47	-3.052	.714	.094	369.33	.039	.179	.039	.289	4.583	.065
1310	1	272.35	99.09	77.88	44.79	-1.652	.277	-.077	283.11	.025	.184	.005	.295	4.323	-.030
1310	2	333.27	108.72	93.50	53.00	-2.639	.394	.532	346.11	.030	.181	.047	.261	4.543	-.043
1335	1	250.68	91.77	71.75	41.05	-1.341	-.210	-.059	260.60	.021	.183	.003	.293	4.267	-.057
1335	2	301.66	98.36	93.13	46.65	-1.752	.164	.588	315.35	.017	.171	.055	.302	4.454	-.396
1400	1	254.98	96.97	76.47	40.69	-1.392	-.109	-.218	265.93	.019	.181	-.010	.302	4.283	.029
1400	2	304.76	110.43	98.52	48.04	-2.076	-2.057	.635	320.11	.026	.185	.036	.322	4.501	.065
1425	1	290.77	98.71	84.45	46.85	-1.743	-.253	-.189	302.59	.018	.177	.001	.289	4.289	-.005
1425	2	337.39	112.74	100.42	54.90	-2.815	.738	.117	353.97	.032	.179	.033	.298	4.454	-.043
1450	1	303.05	102.80	87.42	47.83	-1.862	.364	-.128	319.88	.013	.169	.014	.278	4.232	-.069
1450	2	384.41	109.47	102.53	52.55	-2.396	-.054	-.157	397.71	.014	.147	.031	.262	4.363	-.089
1530	1	309.32	101.24	84.16	47.58	-1.705	.533	-.108	320.57	.009	.166	-.003	.270	4.248	.035
1530	2	373.69	116.65	109.77	59.07	-2.594	-.551	1.702	389.35	.006	.159	.050	.291	4.088	.006
1600	1	245.56	94.85	65.65	37.91	-1.274	-.849	.015	253.75	.018	.171	-.012	.264	4.311	.063
1600	2	304.38	105.86	89.13	51.60	-2.309	-2.084	1.633	316.53	.013	.184	.048	.281	4.430	.353
1630	1	224.96	85.46	63.37	37.25	-1.013	.166	-.110	233.14	.023	.186	-.016	.277	4.309	.003
1630	2	280.28	105.28	79.26	35.00	-1.288	-.584	-1.306	290.76	.015	.152	.034	.282	4.395	-.030
1700	1	190.44	70.82	49.70	30.34	-.730	-.240	-.050	196.65	.021	.174	-.039	.264	4.261	-.025
1700	2	241.55	79.74	64.94	25.30	-.577	-1.972	-.388	249.80	.001	.119	.039	.264	4.318	-.082
1735	1	198.54	66.24	46.58	29.30	-.700	.049	-.034	203.82	.005	.160	0.000	.235	4.250	-.052
1735	2	240.31	68.30	53.00	23.63	-.567	-.887	-.493	246.12	-.006	.109	.036	.224	4.240	-.075
1835	1	150.91	52.42	36.30	22.89	-.430	-.184	-.006	155.25	.003	.169	-.009	.251	4.208	-.032
1835	2	181.85	54.85	41.52	18.14	-.277	-.615	-.411	186.53	-.001	.216	.029	.233	4.130	-.103
1835	1	115.15	33.37	27.97	17.05	-.214	-.032	.026	118.51	.006	.164	-.012	.247	4.171	-.034
1835	2	152.29	40.04	30.46	13.63	-.163	-.428	-.206	155.32	-.010	.100	.022	.204	4.049	-.075
1905	1	123.09	39.69	30.18	19.08	-.290	-.218	.030	126.83	.005	.172	0.000	.257	4.179	-.005
1905	2	152.94	43.01	33.53	14.57	-.173	-.369	-.260	156.44	-.009	.106	.024	.216	4.038	-.013

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER 100.000	F	G
91468															
1005	1	-.0340	0.0000	0.0000	-.3425	.0744	.1090	24.	.4680	0.0000	0.0000	0.0000	373	1482	4386
1005	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1035	1	.0068	-.0026	0.0000	-.6326	.0388	.1803	26.	.6250	0.0000	0.0000	0.0000	692	1625	3518
1035	2	-.6785	.0129	0.0000	-.8107	-.1602	.1841	26.	.5660	.2865	-.0217	.1392	3019	4399	8597
1105	1	-.0160	-.0018	0.0000	-.5956	.0537	.1490	26.	.5990	0.0000	0.0000	0.0000	319	1054	2101
1105	2	.1771	.0089	0.0000	-.5806	-.0835	.1626	26.	.5140	.0913	-.1322	.1361	69	665	2005
1200	1	.0842	.0033	0.0000	-.5774	.0511	.1568	26.	.5860	0.0000	0.0000	0.0000	827	1971	3200
1200	2	1.5003	.0154	0.0000	-.6182	.0923	.1777	27.	.5300	.0073	-.2452	.1279	161	962	2118
1230	1	-.0286	.0009	0.0000	-.2735	.1606	.1275	25.	.6590	0.0000	0.0000	0.0000	248	1073	2222
1230	2	-.0643	.0154	0.0000	-.2750	.1612	.1360	26.	.4970	-.8037	-.3203	.1681	169	1134	2392
1310	1	.0297	.0025	0.0000	-.4016	.0348	.1218	26.	.5480	0.0000	0.0000	0.0000	169	1123	2168
1310	2	.0484	.0058	0.0000	-.3619	.0434	.1185	27.	.4540	.2122	.1876	.0911	339	1171	3032
1335	1	.0484	-.0003	0.0000	-.4385	.0701	.1197	26.	.5160	0.0000	0.0000	0.0000	212	1108	2465
1335	2	.0949	-.0014	0.0000	-.3402	.0412	.1042	27.	.3940	-.0279	.1015	.1390	116	802	2197
1400	1	-.0342	-.0034	0.0000	-.3605	-.0609	.1421	26.	.5430	0.0000	0.0000	0.0000	466	1269	2937
1400	2	-.0870	-.0001	0.0000	-.3910	-.0591	.1598	27.	.5090	-.3058	.2526	.1211	626	1451	3367
1425	1	.0040	-.0017	0.0000	-.3546	.0280	.1278	27.	.4290	0.0000	0.0000	0.0000	131	674	1686
1425	2	.0461	.3098	0.0000	-.4134	-.0198	.1550	28.	.4050	.1233	.1112	-.0012	65	1014	2226
1450	1	.0718	-.0049	0.0000	-.2358	.0212	.0896	27.	.3080	0.0000	0.0000	0.0000	136	518	943
1450	2	.0898	-.0009	0.0000	-.2470	-.0048	.0921	28.	.2650	.2448	-.1856	-.0027	24	233	443
1530	1	-.0304	-.0072	0.0000	-.1624	.0335	.0523	26.	.2100	0.0000	0.0000	0.0000	11	406	939
1530	2	-.0096	-.0103	0.0000	-.2114	.0242	.0532	28.	.1960	.5840	.4428	.0992	100	603	1817
1600	1	-.0813	-.0015	0.0000	-.1116	.2152	.0151	28.	1.3000	0.0000	0.0000	0.0000	76	754	1621
1600	2	-.0710	-.0098	0.0000	-.1000	.2872	.0186	29.	.9290	.1061	-.0033	.0809	192	1285	2384
1630	1	-.0053	.0031	0.0000	-.0460	.0040	-.0086	28.	.2830	0.0000	0.0000	0.0000	321	1342	2765
1630	2	.0215	-.0013	0.0000	-.0347	.0038	-.0055	29.	.2090	.5081	.1918	-.0367	348	1047	2668
1700	1	.0208	.0032	0.0000	.2044	-.0575	-.0348	27.	.4120	0.0000	0.0000	0.0000	185	1001	2742
1700	2	.0584	-.0079	0.0000	.2083	-.1400	-.0181	28.	.3450	-.3327	.5569	.0173	21	253	1766
1735	1	.0543	-.0097	0.0000	.2905	.0074	-.0619	24.	.4860	0.0000	0.0000	0.0000	40	526	1168
1735	2	.0604	-.0131	0.0000	.2267	-.0331	-.0255	25.	.4070	-.4064	.1755	-.0189	3	115	1338
1835	1	.0248	-.0145	0.0000	.3364	-.0572	-.0541	23.	.6270	0.0000	0.0000	0.0000	107	889	2339
1835	2	.0866	-.0094	0.0000	.3101	-.0815	-.0278	24.	.5590	-.6703	.3290	.0114	82	368	1454
1835	1	.0306	-.0076	0.0000	.0746	-.0121	-.0323	24.	.9200	0.0000	0.0000	0.0000	13	669	2557
1835	2	.0604	-.0157	0.0000	.1307	-.0282	-.0212	24.	.6940	-.1133	.0422	.0212	15	155	961
1905	1	-.0076	-.0126	0.0000	.1984	-.0339	-.0530	24.	.4880	0.0000	0.0000	0.0000	102	1135	3382
1905	2	.0006	-.0156	0.0000	.1644	-.0404	-.0209	24.	.4180	-.0471	.0483	.0138	88	180	700

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		........CM/SEC	WIND ST DEV	....		......DYNES/CM2	REYNOLDS STRESSES	......							
91468															
1930	1	122.3?	37.29	28.83	17.55	-.241	-.075	-.024	125.96	.003	.158	-.004	.244	4.172	-.003
1930	2	163.65	43.64	34.32	14.69	-.141	-.471	-.275	167.34	-.013	.098	.022	.209	4.017	-.018
2000	1	142.75	41.49	35.30	22.37	-.388	-.090	.023	147.15	.009	.174	.009	.258	4.193	.009
2000	2	181.00	47.58	42.61	18.35	-.165	-.723	-.482	185.88	-.010	.110	.035	.234	4.078	.044
2030	1	115.66	31.85	25.01	15.87	-.188	-.018	-.004	118.41	-.003	.148	-.005	.225	4.140	-.039
2030	2	151.84	35.29	29.60	12.79	-.104	-.399	-.199	154.65	-.016	.090	.028	.195	3.955	-.112
2230	1	143.57	46.36	36.07	21.39	-.382	.040	-.030	148.09	.004	.165	.007	.262	3.864	-.288
2230	2	172.40	47.50	38.10	18.10	-.293	-.335	-.404	177.48	-.001	.112	.025	.217	4.030	.049
2300	1	136.87	40.33	34.31	20.75	-.316	.032	-.047	141.18	-.007	.161	-.002	.257	3.864	.008
2300	2	162.62	40.45	36.79	15.37	-.166	-.411	-.363	166.66	-.012	.102	.027	.223	3.963	-.041
2330	1	126.49	43.37	31.77	19.70	-.322	-.043	-.006	130.57	.011	.178	-.005	.268	3.867	.006
2330	2	160.99	45.54	34.83	14.99	-.114	-.532	-.205	164.65	-.014	.101	.026	.217	3.958	-.004
91568															
	1	144.48	45.42	30.03	22.09	-.359	-.029	-.035	148.97	-.002	.169	-.007	.258	3.868	.004
	2	179.14	52.15	42.94	18.26	-.195	-.649	-.427	184.07	-.007	.116	.021	.237	3.946	-.008
30	1	146.47	45.30	36.27	21.19	-.365	.023	-.044	150.92	-.001	.159	-.004	.254	3.869	-.003
30	2	177.68	48.09	30.24	17.19	-.228	-.429	-.402	181.67	-.010	.101	.021	.213	3.931	-.014
100	1	118.65	37.41	29.90	17.80	-.257	.014	-.030	122.52	.005	.168	-.017	.266	3.869	.014
100	2	150.66	44.31	32.05	14.36	-.178	-.288	-.278	153.89	-.010	.105	.011	.209	3.850	-.055
130	1	122.30	41.99	31.08	18.66	-.308	.002	-.013	126.26	.003	.169	-.015	.266	3.873	.001
130	2	149.54	39.32	34.11	14.75	-.165	-.299	-.303	153.35	-.009	.111	.023	.228	3.915	.047
200	1	136.11	42.69	34.20	20.91	-.346	.054	-.024	140.84	.002	.170	-.008	.261	3.875	-.004
200	2	165.86	45.36	35.98	15.45	-.182	-.322	-.311	169.44	-.005	.104	.016	.210	3.788	-.120
230	1	109.43	37.27	28.49	17.12	-.226	-.044	-.033	113.20	.003	.179	-.014	.276	3.878	.009
230	2	144.16	39.43	29.60	13.18	-.127	-.167	-.224	147.16	-.012	.099	.019	.209	3.823	.032
300	1	98.15	31.30	25.62	14.53	-.142	-.028	-.014	101.48	-.003	.161	-.027	.270	3.883	.017
300	2	123.64	33.85	24.66	10.99	-.078	-.137	-.154	126.08	-.013	.101	.021	.204	3.891	.036
330	1	139.62	47.67	34.10	20.55	-.364	.068	-.044	143.75	-.001	.163	-.020	.253	3.886	-.003
330	2	178.59	50.66	37.92	15.77	-.237	-.646	-.295	182.47	-.013	.096	.022	.211	3.656	-.236
400	1	147.52	46.87	34.57	21.50	-.330	.027	-.002	151.60	-.004	.167	-.012	.245	3.389	-.006
400	2	181.04	50.25	36.15	16.66	-.291	-.396	-.318	184.59	-.008	.104	.026	.203	3.630	-.031
430	1	156.93	48.12	38.22	23.59	-.451	.044	-.006	161.70	.003	.173	-.014	.254	3.693	.006
430	2	192.03	49.58	41.39	18.39	-.324	-.423	-.431	196.43	-.006	.108	.023	.218	3.664	.037
500	1	162.55	51.63	39.57	24.38	-.456	.142	-.062	167.36	.005	.167	-.004	.253	3.895	-.009
500	2	200.20	55.48	46.20	19.33	-.276	-.071	-.522	205.54	-.012	.106	.025	.236	3.833	.167
530	1	174.40	59.44	45.50	27.34	-.599	.089	-.043	180.22	.008	.176	-.001	.267	3.895	-.003
530	2	213.25	69.07	55.45	23.22	-.449	-.508	-.860	220.19	-.009	.121	.038	.256	3.874	.028

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER 100.000		
91468															
1930	1	-.0010	-.0111	0.0000	.1704	-.0035	-.0386	24.	.4400	0.0000	0.0000	0.0000	25	707	2355
1930	2	.0047	-.0180	0.0000	.1681	-.0271	-.0197	24.	.3840	-.1261	.0193	.0161	0	111	882
2000	1	-.0139	-.0091	0.0000	.2161	-.0106	-.0588	24.	.4610	0.0000	0.0000	0.0000	65	1186	2850
2000	2	-.0625	-.0152	0.0000	.1738	-.0499	-.0235	24.	.3920	-.0244	.0211	.0193	3	113	1286
2030	1	.0387	-.0139	0.0000	.1432	-.0143	-.0319	23.	.5210	0.0000	0.0000	0.0000	5	600	1760
2030	2	.0984	-.0203	0.0000	.1435	-.0558	-.0189	24.	.4570	-.0194	.1114	.0240	21	66	763
2230	1	.2918	-.0137	0.0000	.1970	-.0007	-.0489	23.	.4000	0.0000	0.0000	0.0000	140	968	2454
2230	2	-.0584	-.0092	0.0000	.1550	-.0170	-.0248	23.	.3550	-.0328	.0185	.0139	23	207	1001
2300	1	-.0063	-.0218	0.0000	.1547	.0042	-.0429	22.	.4000	0.0000	0.0000	0.0000	50	609	1844
2300	2	.0281	-.0174	0.0000	.1257	-.0262	-.0200	22.	.3350	-.0227	.0150	.0156	0	41	1165
2330	1	-.0094	-.0092	0.0000	.2717	.0030	-.0491	22.	.9220	0.0000	0.0000	0.0000	159	1584	3260
2330	2	-.0130	-.0173	0.0000	.2049	-.0663	-.0055	23.	.6840	-.0332	.0286	.0083	4	94	1345
91568															
	1	-.0058	-.0184	0.0000	.1669	-.0075	-.0413	24.	.3640	0.0000	0.0000	0.0000	90	957	2260
	2	-.0080	-.0132	0.0000	.1636	-.0050	-.0231	23.	.3210	-.0240	.0135	.0143	2	281	1389
30	1	.0030	-.0167	0.0000	.1801	.0026	-.0435	24.	.3670	0.0000	0.0000	0.0000	45	660	1782
30	2	.0030	-.0163	0.0000	.1539	-.0243	-.0216	23.	.3170	-.0205	.0108	.0140	0	34	861
100	1	-.0131	-.0115	0.0000	.1445	.0062	-.0375	23.	.3980	0.0000	0.0000	0.0000	78	925	2996
100	2	.0547	-.0167	0.0000	.1671	-.0115	-.0170	23.	.3690	-.0731	-.0077	.0138	24	169	872
130	1	-.0021	-.0146	0.0000	.1781	.0025	-.0404	23.	.3940	0.0000	0.0000	0.0000	59	1099	2555
130	2	-.0576	-.0167	0.0000	.1340	-.0081	-.0184	23.	.3340	-.0178	.0143	.0105	38	308	.273
200	1	.0052	-.0152	0.0000	.1417	.0049	-.0397	23.	.3570	0.0000	0.0000	0.0000	47	990	2523
200	2	.1095	-.0107	0.0000	.1152	-.0024	-.0202	22.	.3140	.0193	.0106	.0112	4	137	1112
230	1	-.0149	-.0157	0.0000	.1673	-.0038	-.0314	22.	.4050	0.0000	0.0000	0.0000	209	1538	3990
230	2	-.0390	-.0167	0.0000	.1555	.0049	-.0143	22.	.3450	-.0890	-.0016	.0045	0	109	976
300	1	-.0182	-.0161	0.0000	.1186	-.0026	-.0240	22.	.3960	0.0000	0.0000	0.0000	13	862	3563
300	2	-.0728	-.0176	0.0000	.1149	-.0059	-.0121	22.	.3550	.0001	.0059	.0102	13	190	1111
330	1	.0056	-.0175	0.0000	.1826	.0092	-.0345	22.	.3950	0.0000	0.0000	0.0000	12	769	2116
330	2	.2217	-.0194	0.0000	.1927	-.0694	-.0228	22.	.4180	-.0551	.0827	.0184	0	92	489
400	1	.0067	-.0194	0.0000	.1180	-.0028	-.0237	21.	.2440	0.0000	0.0000	0.0000	26	876	1791
400	2	.0209	-.0163	0.0000	.1186	-.0101	-.0166	21.	.1860	.0875	-.0124	.0093	25	209	771
430	1	-.0072	-.0171	0.0000	.1240	.0009	-.0282	21.	.2380	0.0000	0.0000	0.0000	136	1131	2350
430	2	-.0475	-.0144	0.0000	.1090	-.0105	-.0185	21.	-.0760	.0108	.0057	.0108	40	165	984
500	1	.0140	-.0119	0.0000	.1467	.0162	-.0282	22.	.2670	0.0000	0.0000	0.0000	40	832	2002
500	2	-.1700	-.0186	0.0000	.1193	.0083	-.0192	21.	.2260	.0169	.0130	.0102	39	111	887
530	1	.0030	-.0108	0.0000	.1251	.0056	-.0308	22.	.2220	0.0000	0.0000	0.0000	124	1053	2184
530	2	-.0360	-.0196	0.0000	.1278	.0067	-.0251	21.	.2090	.0482	.0282	.0131	72	278	1541

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND	F ELEV	FSD ANGLE	G AZIM	GSD ANGLE	WIND DIR	WIND SHIFT
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC..........				......DYNES/CM2......			CM/SEC	RAD	RAD	RAD	RAD	RAD	RAD
91568															
600	1	182.91	60.52	46.43	27.67	-.579	.024	-.007	188.82	-.002	.172	.004	.265	3.889	-.010
600	2	212.44	65.72	49.26	26.24	-.719	-.567	-.474	218.04	.014	.141	.020	.234	3.851	-.006
630	1	190.55	67.69	48.89	29.45	-.788	.182	.003	196.82	.008	.181	.010	.269	3.873	-.023
630	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	-.030
700	1	182.09	69.88	51.89	29.80	-.797	.098	-.070	189.63	.018	.196	.005	.307	3.838	-.030
700	2	146.61	66.89	49.22	28.78	-.859	-.190	-.098	154.35	.020	.255	.041	.350	3.785	-.524
730	1	194.82	71.26	51.77	31.34	-.720	.115	-.057	201.76	.004	.190	.010	.284	3.794	-.048
730	2	150.99	66.69	48.98	29.61	-.860	-.334	-.126	158.70	.019	.246	.034	.342	3.911	.132
800	1	187.12	82.68	53.64	32.39	-.803	.053	-.088	194.65	.019	.214	.019	.309	3.760	-.044
800	2	147.70	72.72	56.29	30.83	-.946	-.578	-.238	157.31	.029	.266	.062	.376	3.921	-.018
830	1	228.11	85.23	63.83	37.02	-1.032	.083	-.057	236.91	.010	.187	.010	.289	3.748	-.003
830	2	180.81	79.55	63.01	35.24	-1.125	-.136	-.284	191.07	.014	.244	.067	.352	4.046	.120
1200	1	213.52	196.63	164.54	69.54	-1.577	15.515	.936	262.02	.220	.399	.131	.579	4.409	0.000
1200	2	189.06	161.77	108.64	58.18	-2.619	1.496	-1.104	208.40	.242	.392	.349	.396	4.762	0.000
1300	1	322.38	135.86	99.07	50.96	-2.400	-.513	-.025	336.88	.019	.194	-.209	.326	3.795	-.275
1300	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1330	1	315.62	146.85	101.34	48.80	-1.939	.268	-.176	330.31	.051	.230	-.249	.386	3.806	.052
1330	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1400	1	316.63	150.78	97.93	50.00	-1.991	.683	-.153	330.56	.038	.227	-.177	.364	3.812	-.066
1400	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1430	1	307.63	136.75	97.40	48.66	-1.947	.216	-.214	321.93	.030	.217	-.223	.356	3.824	.058
1430	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	AIR TEMP ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER 100.000	F	G
91568															
600	1	.0086	-.0194	0.0000	.0886	-.0016	-.0207	22.	.1970	0.0000	0.0000	0.0000	171	938	2093
600	2	-.0057	-.0002	0.0000	.0869	-.0033	-.0195	21.	.1560	.1047	-.1097	-.0610	27	519	1547
630	1	.0242	-.0147	0.0000	-.0178	.0024	-.0007	23.	.2400	0.0000	0.0000	0.0000	137	1288	2286
630	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
700	1	.0251	-.0095	0.0000	-.1378	.0019	.0312	23.	.2900	0.0000	0.0000	0.0000	366	1907	4391
700	2	.5106	-.0309	0.0000	-.1288	.0214	.0246	23.	.3250	-.0853	-.0740	.0494	1446	5842	10267
730	1	.0466	-.0185	0.0000	-.1409	-.0043	.0621	24.	.4430	0.0000	0.0000	0.0000	299	1691	3119
730	2	-.1621	-.0256	0.0000	-.1762	-.0496	.0557	24.	.4480	-.2239	.1397	.0563	1001	5001	8815
800	1	.0345	-.0117	0.0000	-.4441	-.0347	.0890	26.	.7430	0.0000	0.0000	0.0000	814	2897	5179
800	2	-.0227	-.0250	0.0000	-.3862	.0932	.0855	25.	.6870	-.3928	-.0642	.1257	1493	6644	12454
830	1	.0007	-.0129	0.0000	-.3712	.0185	.1242	24.	.5850	0.0000	0.0000	0.0000	232	1273	2432
830	2	-.1399	-.0292	0.0000	-.3115	-.0313	.1056	24.	.5520	-.5270	.1165	.1407	1054	4669	9421
1200	1	-.4450	-.0074	0.0000	-2.2449	-1.2529	.1270	25.	.8080	0.0000	0.0000	0.0000	27165	37812	43367
1200	2	-.3379	.0025	0.0000	-1.9726	-.8544	.2400	27.	.9590	-18.6285	-9.0759	1.5793	28796	37799	45940
1300	1	.2668	-.0116	0.0000	-.7806	.0039	.2072	25.	.6160	0.0000	0.0000	0.0000	1040	2128	6626
1300	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1330	1	-.1052	-.0049	0.0000	-.4554	-.0014	.1460	24.	.4820	0.0000	0.0000	0.0000	5252	6488	15324
1330	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1400	1	.0261	-.0141	0.0000	-.6311	-.0508	.1609	25.	.5250	0.0000	0.0000	0.0000	4819	5718	11133
1400	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1430	1	-.0905	-.0141	0.0000	-.4801	-.0007	.1334	24.	.4300	0.0000	0.0000	0.0000	3216	4409	11116
1430	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		....	WIND ST DEV ....CM/SEC........		..	.....KEYNOLDS STRESSES	DYNES/CM2......								
91168															
30	1	107.08	39.07	33.50	18.53	-.260	-.023	0.000	112.28	.026	.186	.015	.322	5.774	0.000
30	2	104.16	40.11	41.52	24.37	-.615	-.152	0.000	112.28	.071	.317	.040	.387	5.999	0.000
715	1	126.73	43.80	41.59	22.51	-.414	.037	0.000	133.64	.043	.206	.014	.356	5.244	0.000
715	2	126.72	43.75	24.49	27.57	-.482	.132	0.000	128.74	.055	.252	-.002	.149	5.728	1.872
740	1	144.91	46.15	48.69	25.45	-.538	-.054	0.000	153.15	.036	.195	.012	.344	5.368	.121
740	2	144.91	56.39	35.23	30.41	-.748	.188	0.000	148.48	.048	.244	-.006	.158	5.731	.008
830	1	195.71	70.02	68.74	33.57	-.889	-1.179	0.000	207.41	.037	.191	.023	.350	5.410	.053
830	2	195.69	75.83	47.10	41.36	-1.480	-.729	0.000	201.09	.050	.242	0.000	.188	5.750	.011
900	1	166.97	64.65	69.08	25.12	-.660	.110	0.000	180.56	.042	.207	.027	.416	5.271	-.135
900	2	166.95	69.16	51.86	35.85	-1.007	.055	0.000	173.77	.061	.244	-.002	.202	5.602	-.145
1000	1	211.22	74.80	76.00	36.47	-1.047	-.113	0.000	224.80	.036	.192	.036	.366	5.460	.319
1000	2	211.20	89.59	57.59	43.49	-1.646	-.348	0.000	218.32	.056	.235	-.001	.195	5.774	-.035
1135	1	224.74	86.67	77.67	37.24	-1.086	-.492	0.000	238.46	.034	.187	.034	.368	5.418	-.044
1135	2	218.19	87.27	60.48	37.39	-1.114	.049	0.000	226.29	.044	.251	.001	.287	5.742	-.036
1230	1	222.47	85.30	89.11	38.65	-1.134	-1.873	0.000	240.66	.028	.190	.009	.417	5.336	-.108
1230	2	228.02	89.87	80.35	37.72	-1.247	-2.543	0.000	242.53	.042	.197	-.008	.379	5.645	-.087
1330	1	214.62	83.41	87.93	37.53	-1.030	-.318	0.000	232.19	.045	.199	-.010	.413	5.055	-.299
1330	2	210.34	85.27	75.26	37.57	-1.396	-.830	0.000	222.20	.064	.219	-.010	.325	5.355	-.288
1400	1	231.40	96.32	94.10	38.91	-1.142	-1.970	0.000	249.46	.042	.200	-.007	.404	5.089	.037
1400	2	226.65	90.14	77.96	38.15	-1.350	-1.683	0.000	239.23	.051	.200	-.007	.340	5.408	.050
1430	1	146.59	96.59	79.06	29.83	-.842	-1.513	0.000	167.70	.096	.277	-.017	.756	4.580	-.520
1430	2	185.09	72.89	71.84	31.34	-.840	-.878	0.000	197.62	.039	.197	-.004	.361	5.088	-.323
1500	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1500	2	162.31	71.29	64.26	30.31	-.828	-1.343	0.000	173.53	.057	.227	-.005	.366	5.136	.049
1535	1	181.97	78.40	54.66	30.46	-.768	-.078	0.000	189.95	.047	.209	-.092	.331	4.868	-.034
1535	2	183.06	79.43	54.51	30.17	-.784	-.023	0.000	190.23	.034	.200	-.006	.274	5.100	-.034
1605	1	160.88	72.94	56.21	28.89	-.700	-.435	0.000	169.96	.049	.214	-.080	.372	4.845	-.035
1605	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1640	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1640	2	138.17	63.35	42.14	25.17	-.563	-.484	0.000	143.71	.043	.219	-.008	.274	4.875	-.191
1840	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1840	2	68.35	30.89	20.21	13.29	-.114	-.118	0.000	70.98	.018	.194	.141	.287	5.074	.955
91268															
710	1	111.84	46.69	34.16	20.26	-.282	-.066	0.000	117.11	.039	.233	-.041	.348	4.327	.112
710	2	103.43	51.33	24.01	18.70	-.371	-.128	0.000	106.76	.095	.268	-.239	.392	3.870	.112
740	1	103.83	51.23	39.79	21.03	-.310	-.118	0.000	110.86	.067	.272	-.023	.401	4.392	.047
740	2	99.09	48.08	46.31	22.46	-.368	.020	0.000	108.62	.056	.286	.113	.449	4.128	-.094

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER 100,000		
91168															
30	1	.1740	.0073	.0720	.0693	-.0094	-.0222	5.	.2190	0.0000	0.0000	0.0000	122	1377	2955
30	2	-.0050	.0227	-.0780	.0798	-.0031	-.0398	7.	.2290	0.0000	0.0000	0.0000	124	9739	18390
715	1	1.2355	.0163	0.0000	-.0925	-.0221	.0576	10.	.5940	0.0000	0.0000	0.0000	144	2347	4415
715	2	1.2838	.0156	-.1440	-.0865	.0040	.0553	9.	.5640	0.0090	0.0000	0.0000	452	9216	43429
740	1	-.1229	.0131	.0300	-.1686	.0005	.0781	11.	.6250	0.0000	0.0000	0.0000	14	1505	2826
740	2	-.0039	.0036	-.1470	-.2408	-.0029	.0784	11.	.5590	0.0000	0.0000	0.0000	1392	10551	41401
830	1	-.0745	.0142	.0270	-.3946	.0755	.1214	13.	.6200	0.0000	0.0000	0.0000	188	1499	1811
830	2	-.0282	.0106	-.0470	-.4164	-.0136	.1476	13.	.5930	-.3237	-.1722	.2556	400	8468	41551
900	1	.1504	.0123	.0100	-.2895	-.1135	.1460	14.	.7290	0.0000	0.0000	0.0000	891	2822	4077
900	2	.1558	.0184	-.0520	-.4346	-.1698	.1711	14.	.7740	-.5514	.0020	.2823	1706	11186	38228
1000	1	-.0388	.0129	.0210	-.4250	.0388	.1878	17.	.7500	0.0000	0.0000	0.0000	193	1588	2243
1000	2	.0336	.0177	.0040	-.5811	.0423	.1911	16.	.7640	.4325	.2957	.2756	690	9273	42907
1135	1	.0389	.0107	.0190	-.1093	-.0052	.0427	18.	.2600	0.0000	0.0000	0.0000	232	1462	2416
1135	2	.0311	.0078	-.0270	-.3589	-.0289	.1299	18.	.5740	.2958	.1931	.2931	665	1199	24523
1230	1	.0837	.0161	.0120	-.3380	-.1056	.1943	20.	.6030	0.0000	0.0000	0.0000	250	1402	2235
1230	2	.0512	.0178	-.0210	-.3239	-.1550	.1716	21.	.7240	1.0575	-1.6785	.1481	140	297	20896
1330	1	.3016	.0224	.0050	-.3974	-.0796	.1686	21.	.6660	0.0000	0.0000	0.0000	711	2076	3396
1330	2	.2757	.0241	.0130	-.4865	-.0111	.1667	22.	.6800	-.1007	-.4944	.1986	1140	3647	29983
1400	1	-.0615	.0127	.0050	-.2881	-.0938	.0978	21.	.5890	0.0000	0.0000	0.0000	1184	2661	5240
1400	2	-.0809	.0216	-.0090	-.2117	-.1819	.1024	22.	.6030	.1671	.0915	.1391	661	2420	24512
1430	1	.3008	.0214	.0220	-.0501	-.0740	.0476	21.	.4860	0.0000	0.0000	0.0000	6275	10946	17270
1430	2	.3090	.0119	0.0000	-.0371	-.1193	.0353	22.	.4600	-1.1318	.6484	.1845	601	2315	25148
1500	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1500	2	-.0991	.0186	-.0250	-.2632	.0730	.0846	22.	.5710	.6339	-1.6485	.1639	1398	4140	29427
1535	1	-.1166	.0163	-.0240	-.1779	-.0122	.0322	21.	.3240	0.0000	0.0000	0.0000	1155	3336	9789
1535	2	.0375	.0058	-.0250	-.1780	.0084	.0427	22.	.3530	.0793	-.5289	.1641	318	2101	22840
1605	1	.0091	.0188	-.0010	.1178	.0649	-.0021	21.	.4400	0.0000	0.0000	0.0000	1123	3385	10065
1605	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1640	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1640	2	.1755	.0102	-.0150	.0090	-.0030	.0022	22.	.1200	-.6660	.1946	.1034	644	3569	29066
1840	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0060	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1840	2	-.9846	.0002	-.0850	.0622	-.0086	-.0297	18.	.4190	-.0900	.0002	.0027	561	2230	9667
91268															
720	1	-.6490	.0070	-.0290	-.0157	-.0406	.0329	13.	-1.0610	0.0000	0.0000	0.0000	889	4334	9791
720	2	-.2066	.0224	-.0930	-.0543	-.0236	.0287	14.	.4610	-.0068	.0178	.0118	5957	10328	18679
740	1	-.0589	.0135	-.0130	-.1215	.0209	.0479	14.	.4130	0.0000	0.0000	0.0000	2898	8340	14179
740	2	.0620	.0008	-.0150	-.0832	-.0161	.0497	15.	.3660	-.4152	-.1720	.0781	2700	9163	15479

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RHV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC..........				......DYNES/CM2.......									
91268															
810	1	93.96	51.80	37.24	19.12	-.251	-.375	0.000	101.08	.079	.296	-.040	.475	4.759	.383
810	2	87.55	51.97	44.42	20.37	-.308	-.831	0.000	96.99	.108	.325	.182	.490	5.121	.925
900	1	134.13	61.97	45.87	26.03	-.553	-.326	0.000	142.07	.058	.249	-.170	.388	5.010	.381
900	2	133.93	60.34	38.97	24.97	-.626	-.494	0.000	139.90	.081	.248	-.157	.366	5.310	.528
930	1	162.66	74.70	55.83	29.70	-.699	-.105	0.000	171.84	.055	.230	-.025	.364	4.956	-.198
930	2	156.35	77.63	57.06	30.29	-.951	-.568	0.000	166.38	.075	.261	.101	.388	5.382	-.186
1005	1	214.08	81.94	70.22	36.52	-1.061	-.108	0.000	225.65	.040	.198	.007	.345	4.879	-.110
1005	2	192.78	91.06	64.47	36.25	-1.136	-.527	0.000	202.80	.064	.258	.258	.337	5.409	-.131
1035	1	185.77	87.79	74.56	32.82	-.777	-.757	0.000	199.72	.044	.235	.105	.418	4.740	-.237
1035	2	152.98	98.11	96.03	33.59	-.998	-2.107	0.000	177.64	.106	.308	.165	.681	4.844	-.472
1105	1	196.15	96.60	73.47	34.43	-.936	-.439	0.000	209.34	.060	.239	.047	.404	4.788	.106
1105	2	180.21	102.31	64.94	32.99	-1.002	-1.027	0.000	191.30	.100	.278	-.100	.439	4.567	-.012
1135	1	153.40	94.82	68.57	31.56	-.824	-.055	0.000	166.18	.079	.289	.162	.436	4.722	-.181
1135	2	138.69	93.78	69.19	30.60	-.662	-1.002	0.000	152.38	.119	.328	.089	.485	4.580	-.176
1205	1	137.38	108.69	60.46	29.07	-.614	.107	0.000	147.40	.162	.351	.212	.419	4.873	.100
1205	2	161.39	91.89	79.14	33.50	-1.029	-.505	0.000	177.36	.105	.298	.093	.464	4.589	-.422
1305	1	199.41	113.81	71.30	34.90	-.840	.580	0.000	210.97	.066	.277	.207	.365	4.426	-.422
1305	2	179.55	104.00	75.01	37.54	-1.230	-.118	0.000	192.76	.097	.305	.291	.393	4.499	-1.141
1335	1	174.72	83.03	65.42	32.50	-.653	.547	0.000	185.77	.024	.240	.018	.381	4.222	-.014
1335	2	160.22	86.53	68.37	33.31	-.890	-.422	0.000	172.78	.058	.281	.109	.410	4.320	.002
1430	1	201.76	86.17	61.15	34.32	-.902	.336	0.000	210.59	.018	.208	.024	.309	4.111	-.118
1430	2	197.76	87.24	63.35	34.95	-1.242	-.191	0.000	207.39	.026	.226	.145	.323	4.232	-.123
1500	1	168.70	76.69	64.25	31.47	-.693	.244	0.000	179.84	.035	.234	.026	.375	4.201	.089
1500	2	157.89	79.07	65.49	31.00	-.896	.025	0.000	169.72	.063	.263	.252	.390	4.392	.053
1530	1	144.24	72.53	51.35	28.03	-.607	.230	0.000	152.85	.057	.262	.057	.372	4.155	-.078
1530	2	141.48	73.53	53.16	28.15	-.760	.294	0.000	150.59	.056	.265	.272	.367	4.355	-.057
1600	1	167.39	74.29	57.43	31.68	-.628	-.387	0.000	176.74	.031	.233	.028	.353	4.206	.080
1600	2	168.38	78.35	61.26	31.42	-.914	-.681	0.000	178.58	.031	.240	.185	.357	4.376	.108
1630	1	147.30	57.29	44.95	25.71	-.434	-.404	0.000	154.09	.014	.207	.014	.320	4.191	-.002
1630	2	133.03	55.63	48.04	26.08	-.656	-.241	0.000	141.09	.059	.250	.179	.355	4.336	-.034
1710	1	106.03	40.08	29.83	18.27	-.252	-.090	0.000	110.20	.008	.196	.009	.293	4.104	-.082
1710	2	95.61	42.89	29.19	18.27	-.251	-.380	0.000	99.67	.029	.244	.346	.292	4.367	-.136
1740	1	73.94	21.67	16.68	9.41	-.029	-.089	0.000	75.66	-.020	.153	.009	.227	3.756	-.348
1740	2	70.92	24.20	15.52	8.51	-.049	.050	0.000	72.42	.014	.199	.077	.210	3.972	-.126
1805	1	76.02	16.79	14.18	7.37	-.027	-.019	0.000	77.34	-.025	.116	.005	.198	3.670	-.081
1805	2	78.53	13.99	14.65	6.35	-.017	-.045	0.000	79.89	-.023	.088	.052	.190	3.954	.007

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER 100,000	F	G
91268															
810	1	-.5043	.0085	-.0150	-.1189	-.0599	.0807	16.	.6680	0.0000	0.0000	0.0000	5758	11909	27059
810	2	-1.0694	.0202	-.0660	-.0625	-.1902	.0765	16.	.6380	-.9211	.7981	.1453	7775	16061	29855
900	1	-.4253	.0222	-.0260	-.2101	-.0470	.1218	20.	-.4090	0.0000	0.0000	0.0000	1261	5640	16190
900	2	-.5937	.0312	-.0630	-.1825	-.0679	.1121	21.	.7080	-.2673	.0435	.1754	2242	6940	10661
930	1	.1867	.0172	-.0030	-.2629	.0160	.1373	21.	.6910	0.0000	0.0000	0.0000	2153	4688	9479
930	2	.1390	.0176	-.0480	-.3521	.0245	.1489	22.	.7180	-.4144	.0168	.2240	3417	7980	17139
1005	1	.1023	.0149	-.0280	-.3840	-.0937	.1622	20.	.5820	0.0000	0.0000	0.0000	362	1996	3429
1005	2	.0891	.0044	-.0450	-.3765	-.0296	.1454	22.	.6830	0.0000	0.0000	0.0000	4805	7851	19855
1035	1	.1951	.0064	-.0170	-.4288	-.0350	.1459	23.	.7170	0.0000	0.0000	0.0000	2114	5079	8763
1035	2	.2741	.0047	-.0140	-.5873	-.0264	.1439	24.	.7380	1.4050	-4.2097	.2056	9430	14768	26125
1105	1	-.1523	.0117	-.0420	-.3917	-.0810	.1638	24.	.7060	0.0000	0.0000	0.0000	3765	6197	12103
1105	2	-.0906	.0180	-.0720	-.4307	-.0987	.1445	24.	.7130	-.5743	-.1118	.2328	8026	11696	18339
1135	1	.1363	.0057	-.0350	-.6614	-.0107	.1576	24.	.8340	0.0000	0.0000	0.0000	5663	10858	16346
1135	2	.0526	.0053	-.0500	-.5387	-.0043	.1495	25.	.8000	-.1859	-.0842	.2277	12375	17826	30444
1205	1	-.1661	.0071	-.0190	-.7367	-.0488	.0872	24.	.8170	0.0000	0.0000	0.0000	17811	24367	33407
1205	2	-.0912	.0111	-.0230	-.3943	.0434	.1323	25.	.7200	-.3246	-.2975	.2230	9015	13632	25252
1305	1	.4231	-.0107	-.0390	-.2796	.0440	.1258	25.	.6240	0.0000	0.0000	0.0000	7944	10484	15254
1305	2	1.1036	.0018	-.0020	-.3875	.1127	.1490	25.	.6580	-.5050	.2737	.1125	8508	13672	30045
1335	1	.0046	-.0136	-.0420	-.3392	.0161	.1250	25.	.6840	0.0000	0.0000	0.0000	1584	5005	8061
1335	2	-.0383	-.0001	-.0370	-.3658	.0381	.1473	25.	.7170	-.0970	-.1542	.1455	3120	9346	16356
1430	1	.1135	-.0091	-.0270	-.3143	.0502	.0987	15.	.4980	0.0000	0.0000	0.0000	785	2638	4498
1430	2	.1068	-.0125	-.0020	-.3842	.0119	.1176	26.	.5170	-.2694	-.1772	.1121	834	3926	9569
1500	1	-.0952	.0001	-.0060	-.2812	.0165	.0907	15.	.4870	0.0000	0.0000	0.0000	957	4173	7660
1500	2	-.0828	.0024	-.0020	-.3063	.0235	.0920	26.	.4690	-.1604	.2016	.1238	3864	7890	22456
1530	1	.0585	.0081	.0060	-.2124	.0270	.0727	15.	.4310	0.0000	0.0000	0.0000	2892	7224	12557
1530	2	.0431	.0003	-.0300	-.2565	-.0177	.0736	26.	.4230	-.1770	.0522	.1019	2561	7683	20981
1600	1	-.1077	-.0042	-.0050	-.1246	.0205	.0414	15.	.2670	0.0000	0.0000	0.0000	1541	4244	8461
1600	2	-.1429	-.0069	-.0500	-.1605	.0297	.0434	25.	.2390	-.3016	-.0829	.1041	1025	4903	14392
1630	1	-.0194	-.0091	-.0270	-.0134	.0051	-.0025	15.	.2110	0.0000	0.0000	0.0000	437	2389	5899
1630	2	.0076	.0140	-.0460	-.0538	.0052	.0108	27.	.1490	-.3391	.1524	.1155	1230	6230	16049
1710	1	.0733	-.0142	-.0100	.1122	-.0462	-.0270	23.	.4200	0.0000	0.0000	0.0000	238	1889	5824
1710	2	.0888	-.0127	-.0450	.1232	-.0423	-.0175	23.	.3450	-.7071	.4159	.0334	1366	4953	25416
1740	1	.3343	-.0316	.0900	.1403	-.0323	-.0083	21.	.6810	0.0000	0.0000	0.0000	854	1677	4647
1740	2	1.4649	-.0163	.2220	-.0256	-.0455	-.0047	21.	.6070	.0304	-.2869	.2516	3357	4734	10711
1805	1	.0791	-.0314	.0180	.0861	-.0237	-.0121	20.	-.1730	0.0000	0.0000	0.0000	34	478	1892
1805	2	-.0110	-.0252	-.0110	.0523	-.0439	-.0089	20.	.5270	.0401	-.0080	.0100	0	57	503

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND	F ELEV	FSD ANGLE	G AZIM	GSD ANGLE	WIND DIR	WIND SHIFT
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC..........				......DYNES/CM2.......			CM/SEC	RAD	RAD	RAD	RAD	RAD	RAD
91368															
145	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
145	2	111.41	42.59	8.75	2.66	-.076	-.316	0.000	111.80	.001	.107	.187	.125	4.426	-.030
215	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
215	2	168.01	53.31	8.86	4.52	-.121	-.099	0.000	168.23	-.002	.044	.054	.062	4.349	.057
245	1	162.69	44.43	9.37	4.37	-.080	.051	0.000	162.91	0.000	.038	-.013	.057	4.334	.022
245	2	161.55	53.47	9.00	4.72	-.109	.023	0.000	161.75	.002	.042	-.001	.054	4.317	.022
315	1	146.87	32.50	7.42	3.09	-.057	-.014	0.000	147.03	-.002	.032	-.011	.050	4.328	-.008
315	2	142.60	34.10	7.02	3.04	-.073	.002	0.000	142.73	-.001	.036	0.000	[illegible]	4.314	-.004
335	1	167.12	41.34	8.90	4.66	-.087	.015	0.000	167.32	-.001	.034	-.009	.050	4.353	.022
335	2	169.70	46.20	9.44	5.29	-.134	.010	0.000	169.93	.002	.044	.001	.055	4.336	.021
415	1	178.36	52.70	11.30	5.43	-.115	.014	0.000	178.69	.001	.047	-.011	.069	4.333	-.017
415	2	174.49	49.66	9.89	5.23	-.131	-.049	0.000	174.75	.001	.042	.003	.059	4.335	-.003
445	1	186.68	48.58	9.66	5.22	-.123	-.052	0.000	186.90	-.002	.034	-.012	.049	4.305	-.027
445	2	187.48	52.51	10.13	5.52	-.139	-.014	0.000	187.73	.001	.038	.002	.052	4.312	-.021
515	1	180.80	59.68	11.15	5.54	-.104	.064	0.000	181.11	0.000	.044	-.010	.065	4.334	.027
515	2	173.91	58.86	10.10	5.44	-.127	-.036	0.000	174.18	0.000	.043	.004	.062	4.353	.039
545	1	132.19	38.64	8.24	3.26	-.057	0.000	0.000	132.42	0.000	.048	-.027	.078	4.304	-.012
545	2	132.94	45.35	8.13	4.02	-.093	-.049	0.000	133.17	.003	.068	.003	.087	4.348	-.005
615	1	139.56	47.53	8.77	3.92	-.083	-.075	0.000	139.81	-.002	.042	-.023	.068	4.257	-.051
615	2	130.49	45.10	8.26	3.95	-.103	-.096	0.000	130.74	.005	.073	.004	.093	4.300	-.049
630	1	213.14	67.49	14.16	7.08	-.170	-.113	0.000	213.59	0.000	.051	-.011	.077	4.300	.030
630	2	200.72	70.53	13.85	7.50	-.239	-.154	0.000	201.21	.006	.060	.004	.082	4.307	.007
705	1	240.37	83.52	24.79	8.61	-.243	-.082	0.000	241.51	.003	.059	-.005	.105	4.355	.049
705	2	231.58	89.85	19.67	8.52	-.309	-.175	0.000	232.37	.009	.073	.007	.106	4.338	.027
800	1	195.30	197.67	62.62	26.57	-.707	7.498	0.000	211.70	.245	.370	.346	.664	5.162	.457
800	2	210.93	185.89	32.41	27.29	-.619	-2.392	0.000	212.77	.236	.364	.336	.179	4.535	-.131
835	1	225.68	228.40	69.65	26.25	-.921	9.604	0.000	258.34	.205	.349	.172	.847	5.113	.124
835	2	248.37	200.86	50.46	26.85	-1.101	4.054	0.000	254.86	.201	.346	.170	.330	4.503	.134
905	1	283.57	143.25	56.53	20.85	-.925	-2.289	0.000	0.00	.012	.110	-.008	.128	4.383	-.554
905	2	281.60	109.26	55.33	20.27	-.984	.158	0.000	0.00	.016	.119	.024	.102	4.313	-.031
935	1	298.08	107.92	80.65	20.91	-.719	-1.282	0.000	0.00	.014	.121	-.002	.129	4.418	.032
935	2	298.15	110.63	64.23	21.28	-.995	-.912	0.000	0.00	.016	.131	.024	.112	4.343	.030
1005	1	325.96	110.61	75.12	23.12	-.927	-.630	0.000	0.00	.010	.112	-.002	.120	4.363	-.035
1005	2	327.48	112.00	75.40	23.50	-1.118	-.732	0.000	0.00	.014	.123	.016	.115	4.302	-.037
1040	1	328.96	115.14	77.58	22.62	-.862	-.035	0.000	0.00	.010	.105	-.010	.119	4.316	-.064
1040	2	324.49	112.32	71.21	23.03	-1.050	-.611	0.000	0.00	.010	.123	.018	.111	4.244	-.060

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER 100,000		
91368															
145	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
145	2	-.0047	-.0114	-.1580	0.0000	0.0000	0.0000	13.	0.0000	0.0000	0.0000	0.0000	1709	1934	3054
215	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
215	2	-.0635	-.0053	-.2340	0.0000	0.0000	0.0000	13.	0.0000	0.0000	0.0000	0.0000	115	138	243
245	1	.8613	-.0028	.0040	.0093	.0002	-.0012	13.	.0590	0.0000	0.0000	0.0000	91	108	140
245	2	-.0229	-.0021	-.2000	.0412	.0004	-.0023	13.	.1160	0.0000	0.0000	0.0000	43	89	91
315	1	.0069	-.0040	-.1810	.0482	-.0005	-.0046	13.	.2230	0.0000	0.0000	0.0000	15	33	75
315	2	.0030	-.0036	-.2860	.0669	.0023	-.0047	13.	.2470	0.0000	0.0000	0.0000	20	42	51
335	1	-.0218	-.0041	-.1790	.0661	-.0011	-.0069	13.	.2180	0.0000	0.0000	0.0000	5	7	13
335	2	-.0222	-.0020	-.2270	.1030	.0021	-.0091	13.	.2460	0.0000	0.0000	0.0000	46	70	81
415	1	.0162	-.0035	-.0670	.1380	-.0055	-.0102	13.	.3060	0.0000	0.0000	0.0000	110	157	211
415	2	.0001	-.0030	-.1580	.1444	-.0045	-.0101	13.	.3070	0.0000	0.0000	0.0000	59	67	83
445	1	.0260	-.0045	-.1130	.1595	-.0001	-.0112	12.	.3160	0.0000	0.0000	0.0000	7	12	23
445	2	.0202	-.0028	-.1300	.1735	.0036	-.0095	12.	.3180	0.0000	0.0000	0.0000	1	23	16
515	1	-.0266	-.0041	-.0720	.1885	.0005	-.0105	13.	.3190	0.0000	0.0000	0.0000	86	115	182
515	2	-.0420	-.0037	-.1500	.1955	-.0009	-.0105	13.	.3290	0.0000	0.0000	0.0000	51	70	126
545	1	.0102	-.0040	-.1530	.0909	.0001	-.0068	13.	.2980	0.0000	0.0000	0.0000	200	222	411
545	2	-.0027	-.0043	-.1790	.1311	-.0004	-.0075	13.	.3110	0.0000	0.0000	0.0000	428	562	636
615	1	.0469	-.0051	-.1430	.1048	-.0052	-.0033	13.	.2360	0.0000	0.0000	0.0000	90	112	245
615	2	.0390	-.0031	-.2120	.1291	-.0050	-.0041	13.	.2730	0.0000	0.0000	0.0000	588	688	863
630	1	-.0338	-.0043	-.0760	-.0005	-.0005	-.0006	13.	0.0000	0.0000	0.0000	0.0000	160	194	261
630	2	-.0124	-.0014	-.0630	-.0005	-.0005	-.0006	13.	0.0000	0.0000	0.0000	0.0000	119	236	302
705	1	-.0527	-.0033	-.0400	.0167	-.0806	-.0048	10.	1.2130	0.0000	0.0000	0.0000	252	326	379
705	2	-.0364	-.0014	-.0410	-.3277	.0052	.0063	10.	1.3180	0.0000	0.0000	0.0000	421	577	745
800	1	-.1247	.0096	-.0820	2.5939	.4884	-.0247	18.	.9200	0.0000	0.0000	0.0000	29899	37941	47940
800	2	.0069	.0116	.3470	-.1193	.0114	.0089	18.	.2480	-4.7429	.4173	.0872	27992	35931	43940
835	1	.3226	.0077	-.0480	-.9210	-.1688	.0205	17.	.3660	0.0000	0.0000	0.0000	24789	31382	33373
835	2	-.1856	.0081	-.0800	-2.4914	-.3585	.0449	18.	.8660	-8.8854	-1.2167	.1814	23894	30528	31573
905	1	1.1280	-.0002	.0570	-.3512	.1098	.0368	22.	.4850	0.0000	0.0000	0.0000	210	257	292
905	2	.1013	-.0006	-.0430	-.4457	.0151	.0449	22.	.5080	-.8576	-.0292	.1348	200	280	302
935	1	-.1306	.0008	-.0220	-.3927	.0474	.0602	23.	.4720	0.0000	0.0000	0.0000	363	400	444
935	2	-.1315	-.0013	-.0240	-.4941	.0665	.0644	23.	.4800	-.5080	-.5241	.1294	351	450	480
1005	1	.1066	-.0019	-.0020	-.5009	.1563	.0709	23.	.5340	0.0000	0.0000	0.0000	230	284	294
1005	2	.1078	-.0016	-.0010	-.5128	.1516	.0725	23.	.5130	-.2844	-.7561	.1157	320	375	394
1040	1	.2126	-.0006	0.0000	-.5513	.1579	.0720	21.	.5650	0.0000	0.0000	0.0000	157	210	243
1040	2	.1832	-.0056	.0080	-.3876	.2086	.0747	22.	.5740	-.3432	-.0733	.1343	313	375	392

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		....	WIND ST DEV ....CM/SEC..........			REYNOLDS STRESSES ......DYNES/CM2.......									
91368															
1130	1	328.19	110.35	96.36	22.71	-.911	2.763	0.000	0.00	.012	.105	0.000	.146	4.279	-.041
1130	2	336.92	112.62	85.52	23.22	-1.158	.894	0.000	0.00	.008	.111	.018	.128	4.192	-.051
1200	1	347.58	122.21	87.71	24.69	-1.0[illegible]	-.343	0.000	0.00	.016	.125	.002	.129	4.352	.072
1200	2	365.74	124.84	79.81	25.62	-1.35[illegible]	.827	0.000	0.00	.018	.126	.022	.121	4.273	.078
1300	1	299.42	106.37	83.18	46.78	-1.664	.039	0.000	310.63	.010	.174	.010	.280	4.312	-.049
1300	2	283.05	108.86	85.72	48.27	-2.138	-1.046	0.000	295.51	.028	.202	.046	.306	4.235	-.073
1330	1	307.75	112.05	86.87	48.57	-1.767	.218	0.000	319.59	.012	.173	.014	.284	4.358	.042
1330	2	300.92	122.62	89.10	51.27	-2.751	-1.455	0.000	313.66	.028	.203	.057	.305	4.282	.035
1400	1	268.82	99.76	75.59	43.52	-1.535	-.406	0.000	279.04	.019	.188	.010	.293	4.403	.048
1400	2	253.23	97.85	79.26	45.06	-1.965	-1.899	0.000	274.65	.035	.204	.053	.304	4.355	.078
1430	1	247.47	85.24	67.52	37.96	-1.137	-.172	0.000	256.56	.009	.173	-.003	.280	4.222	-.168
1430	2	249.57	89.47	69.21	40.18	-1.515	-.726	0.000	258.94	.018	.190	.032	.285	4.162	-.172
1505	1	233.85	82.32	65.43	37.23	-1.092	.089	0.000	242.62	.014	.177	-.011	.279	4.262	.047
1505	2	235.01	90.45	64.52	37.72	-1.588	-.774	0.000	243.69	.027	.194	.030	.285	4.224	.064
1535	1	266.63	98.84	70.84	42.67	-1.357	.152	0.000	275.79	.013	.178	.009	.271	4.311	.030
1535	2	265.71	104.68	74.94	43.49	-1.880	-.563	0.000	275.80	.025	.198	.041	.289	4.296	.061
1605	1	267.50	104.46	78.77	42.[illegible]	-1.326	.965	0.000	278.28	.009	.178	-.003	.288	4.338	.039
1605	2	269.10	111.75	80.17	42.6[illegible]	-1.755	.544	0.000	279.86	.025	.187	.044	.291	4.338	.039
1635	1	185.12	74.83	50.80	29.78	-.766	-.017	0.000	191.71	.015	.181	-.024	.278	4.285	-.033
1635	2	180.59	70.46	49.71	28.79	-.876	-.382	0.000	186.66	.024	.185	.030	.268	4.316	-.008
1705	1	151.00	67.04	40.59	24.82	-.470	-.188	0.000	156.15	.013	.190	.004	.277	4.215	.319
1705	2	149.04	67.67	41.41	24.53	-.503	.148	0.000	154.41	.021	.187	.035	.282	4.250	-.071
1735	1	104.57	54.30	33.27	18.46	-.205	-.676	0.000	109.27	.014	.202	.026	.333	4.093	-.138
1735	2	109.18	50.43	29.67	15.89	-.259	-.478	0.000	111.56	.006	.161	.012	.260	4.164	-.063
1805	1	100.55	29.24	24.43	14.51	-.146	-.073	0.000	103.50	-.005	.160	.005	.252	4.142	.070
1805	2	101.48	30.47	23.92	14.05	-.183	-.085	0.000	104.06	.006	.152	.016	.230	4.214	.046
1905	1	121.03	46.33	30.91	18.67	-.236	-.008	0.000	124.82	0.000	.165	.011	.259	4.305	.157
1905	2	126.65	46.23	33.90	19.33	-.331	-.196	0.000	130.71	.016	.176	.036	.260	4.357	.123
1935	1	89.72	33.97	22.81	13.52	-.133	-.090	0.000	92.57	-.003	.174	.011	.268	4.255	-.050
1935	2	94.34	35.29	24.07	13.21	-.172	-.194	0.000	97.12	.004	.156	.013	.253	4.321	-.013
2005	1	74.75	22.46	17.98	8.94	-.056	-.031	0.000	77.00	-.013	.134	.015	.264	4.269	.009
2005	2	82.87	24.49	18.23	9.78	-.093	-.091	0.000	84.73	-.010	.118	.022	.217	4.349	.019
2035	1	59.08	44.35	18.38	10.24	-.050	.011	0.000	61.53	.149	.335	.152	.450	4.505	.100
2035	2	63.37	39.27	18.10	10.25	-.075	-.023	0.000	65.81	.014	.225	.061	.367	4.402	.015
2110	1	71.16	51.70	21.20	12.43	-.091	.263	0.000	74.33	.120	.342	.193	.416	4.711	.166
2110	2	103.31	34.37	23.22	13.35	-.158	-.151	0.000	105.66	-.001	.241	.006	.225	4.351	.003

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP SI DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER 100,000		
91368															
1130	1	.1608	.0001	-.0080	-.4792	.1046	.0787	22.	.5450	0.0000	0.0000	0.0000	203	242	240
113C	2	.1760	-.0056	.0100	-.5218	.0871	.0799	23.	.5230	-.2474	.4240	.1018	228	263	292
1200	1	-.2536	.0004	-.0250	-.6655	.0600	.0904	22.	.5920	0.0000	0.0000	0.0000	368	419	451
1200	2	-.2862	.0006	-.0280	-.6584	.0915	.0836	23.	.5520	-.4945	-.1369	.0983	340	418	441
1300	1	.0490	-.0081	-.0220	-.5304	.0595	.1760	26.	.6080	0.0000	0.0000	0.0000	183	711	1432
1300	2	.0569	-.0018	-.0050	-.6034	.0740	.1654	27.	.5890	-.2388	-.0614	.1262	511	2246	4828
1330	1	-.0434	-.0069	-.0220	-.5222	.0572	.1515	26.	.5540	0.0000	0.0000	0.0000	143	686	1641
1330	2	-.0515	-.0043	.0260	-.5993	.1393	.1560	27.	.5120	-.0699	.0468	.1167	402	2271	5063
1400	1	-.0625	-.0060	-.0040	-.2528	.0190	.0953	26.	.6300	0.0000	0.0000	0.0000	[illegible]	1510	2980
1400	2	-.1057	.0036	.0490	-.3012	.0860	.0782	26.	.5810	-.1686	.0679	.1001	365	2390	5778
1430	1	.1647	-.0093	-.0080	-.0607	.0097	.0217	25.	.3170	0.0000	0.0000	0.0000	95	713	1796
1430	2	.1608	-.0076	.0450	-.0297	-.0118	.0156	26.	.2800	-.4287	-.0297	.1264	233	1753	3598
1505	1	-.0452	-.0050	-.0350	-.2257	-.0101	.0358	26.	.3400	0.0000	0.0000	0.0000	34	876	2064
1505	2	-.0813	-.0030	.0250	-.2580	-.0059	.0432	26.	.3110	.0060	.0658	.0882	279	2135	4044
1535	1	-.0322	-.0053	-.0290	-.2567	-.0013	.0606	26.	.3050	0.0000	0.0000	0.0000	181	891	1746
1535	2	-.0748	-.0052	-.0660	-.2977	.0072	.0623	27.	.2840	-.4015	.0642	.1063	676	2287	4546
1605	1	-.0331	-.0108	-.0180	-.1894	.0195	.0318	26.	.3730	0.0000	0.0000	0.0000	184	960	2357
1605	2	-.0438	.0004	-.1570	-.3184	-.0122	.0441	26.	.3600	.5319	.1718	.1242	364	1538	4065
1635	1	.0267	-.0054	-.0250	.2708	-.0191	-.0404	25.	.4910	0.0000	0.0000	0.0000	123	1135	3657
1635	2	-.0089	.0037	-.2130	.2089	-.0198	-.0374	25.	.4150	-.9035	.1253	.1303	169	1555	4230
1705	1	.0884	-.0076	-.0130	.4519	-.0787	-.0366	24.	.5780	0.0000	0.0000	0.0000	282	1815	4528
1705	2	.0535	0.0000	-.1720	.4159	-.0221	-.0348	24.	.5490	-2.5699	.1617	.0575	287	1799	5078
1735	1	.0812	-.0082	-.0070	.4946	-.0345	-.0264	22.	-2.4070	0.0000	0.0000	0.0000	1309	2911	8767
1735	2	.0292	-.0077	-.1820	.4554	-.0677	-.0306	23.	.6840	-1.8021	.3150	.0801	509	1288	3524
1805	1	-.0772	-.0184	-.0330	.1081	-.0040	-.0274	20.	.4870	0.0000	0.0000	0.0000	97	938	3158
1805	2	-.0550	-.0061	-.2080	.1341	-.0013	-.0345	19.	.5620	-.0628	.0152	.0297	76	691	2061
1905	1	-.1607	-.0149	0.0000	.2800	.0091	-.0450	19.	.5750	0.0000	0.0000	0.0000	130	929	3095
1905	2	-.1388	-.0002	-.1980	.2407	.0042	-.0396	18.	.2170	-.2047	-.0004	.0170	219	1447	3826
1935	1	.0405	-.0194	.0290	.1066	-.0180	-.0290	13.	.5560	0.0000	0.0000	0.0000	261	1741	5341
1935	2	-.0050	-.0069	-.2020	.1069	-.0132	-.0316	18.	.5290	.0705	.0263	.0169	181	1017	3604
2005	1	-.0147	-.0217	-.0330	.0846	-.0190	-.0143	18.	.5010	0.0000	0.0000	0.0000	200	724	6080
2005	2	-.0288	-.0168	-.1730	.0990	-.0214	-.0228	17.	.5080	-.0257	-.0030	.0147	0	199	1927
2035	1	0.0000	-.0130	-.0170	.3560	.0190	-.0153	17.	.7230	0.0000	0.0000	0.0000	0	0	0
2035	2	-.0071	-.0078	-.1670	.3313	.0284	-.0118	17.	.6750	-.6308	-.0715	.0105	2981	5636	12990
2110	1	.0120	-.0142	-.0720	.4530	.0134	-.0235	17.	.8470	0.0000	0.0000	0.0000	15579	22110	27972
2110	2	-.0180	-.0103	-.1850	.3229	-.0420	-.0320	18.	-.2870	-.2764	.0653	.0226	83	718	2198

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		........CM/SEC	WIND ST DEV	....		......REYNOLDS STRESSES	DYNES/CM2.......								
91368															
2140	1	147.10	40.42	35.79	22.53	-.360	-.039	0.000	151.55	-.001	.164	.005	.251	4.328	-.196
2140	2	150.20	47.09	34.83	21.95	-.468	-.046	0.000	153.93	.013	.165	.019	.229	4.398	.032
2210	1	142.08	50.31	36.64	24.02	-.450	-.004	0.000	146.83	.017	.187	.008	.269	4.339	.007
2210	2	149.76	55.95	36.81	2?.16	-.535	-.156	0.000	153.99	.014	.178	.032	.251	4.394	0.000
91468															
	1	147.67	55.41	38.61	24.01	-.464	-.091	0.000	152.80	.008	.189	.015	.280	4.442	0.000
	2	149.07	56.86	40.89	24.43	-.551	-.037	0.000	154.28	.016	.195	.038	.281	4.508	.108
30	1	119.08	42.08	30.85	29.59	-.272	-.152	0.000	123.16	.013	.185	.016	.278	4.439	-.004
30	2	115.25	47.95	33.14	19.25	-.349	-.253	0.000	119.70	.024	.202	.036	.299	4.520	.015
110	1	101.65	35.70	27.44	15.74	-.137	-.305	0.000	113.89	-.004	.152	.005	.248	4.388	.053
110	2	108.09	36.15	25.83	15.56	-.227	-.255	0.000	111.11	.010	.166	.002	.249	4.482	.118
140	1	104.61	27.58	20.86	12.48	-.131	-.051	0.000	106.63	-.009	.128	-.008	.204	4.359	-.017
140	2	101.33	25.50	20.72	11.63	-.141	-.104	0.000	103.37	.002	.129	.003	.207	4.472	-.010
240	1	79.37	44.55	19.77	11.83	-.095	.163	0.000	81.85	.056	.275	.118	.335	4.613	-.080
240	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
335	1	123.65	36.93	28.31	18.05	-.269	-.009	0.000	126.84	-.002	.156	-.001	.234	4.351	-.213
335	2	119.23	36.56	26.71	16.82	-.259	-.016	0.000	122.09	.009	.165	.006	.233	4.503	.627
405	1	93.07	33.10	22.15	13.44	-.130	-.048	0.000	96.42	-.001	.162	-.012	.256	4.398	.018
405	2	90.02	32.98	23.27	13.49	-.171	-.053	0.000	93.03	.008	.176	-.019	.274	4.514	.036
530	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
530	2	82.21	43.83	30.97	16.39	-.198	-.833	0.000	98.09	.028	.211	-.001	.304	4.426	.516
600	1	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
600	2	161.01	56.20	40.91	26.18	-.646	-.238	0.000	166.14	.015	.192	.027	.264	4.451	-.003
630	1	131.19	48.32	39.24	23.69	-.385	.491	0.000	146.27	.009	.194	.002	.276	4.283	-.020
630	2	145.01	52.03	37.52	25.16	-.577	-.270	0.000	154.00	.015	.199	.023	.273	4.427	-.020
700	1	166.40	55.22	40.44	26.96	-.524	-.172	0.000	174.16	.006	.183	.009	.275	4.264	-.025
700	2	164.20	58.11	45.64	27.63	-.737	-.104	0.000	170.55	.021	.201	.022	.270	4.411	-.014
730	1	206.01	74.59	53.63	33.47	-.794	-.290	0.000	212.87	.009	.182	.006	.268	4.277	.015
730	2	208.94	76.76	51.00	34.80	-1.176	-.402	0.000	215.77	.022	.196	.030	.268	4.430	.011
800	1	256.13	87.93	64.39	35.70	-1.174	.105	0.000	254.30	.009	.171	-.011	.265	4.297	.037
800	2	246.18	90.18	62.08	40.12	-1.569	-.510	0.000	254.09	.024	.194	.044	.266	4.444	0.000
835	1	259.07	95.03	60.08	39.96	-1.243	-.134	0.000	260.56	.015	.183	-.024	.276	4.324	.040
835	2	248.04	79.86	66.84	41.54	-1.757	-.317	0.000	251.59	.034	.199	.040	.288	4.447	.009
905	1	250.01	90.84	68.66	41.20	-1.345	-.237	0.000	260.32	.021	.191	-.010	.287	4.360	.021
905	2	260.08	95.05	68.52	42.44	-1.700	-.665	0.000	270.00	.023	.190	.045	.272	4.486	.033
935	1	276.14	95.36	72.45	43.19	-1.454	-.386	0.000	285.70	.018	.178	.004	.274	4.376	.002
935	2	272.16	95.21	57.76	44.19	-1.913	-.493	0.000	280.85	.031	.190	.039	.264	4.478	-.003

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER 100,000		
91368															
2140	1	.1937	-.0149	-.0440	.2265	-.0032	-.0547	18.	.4680	0.0000	0.0000	0.0000	30	735	1972
2140	2	-.0404	-.0040	-.2220	.2150	.0011	-.0567	17.	.4560	-.6254	.0175	.0077	55	915	1653
2210	1	-.0098	-.0033	-.0130	.2029	-.0021	-.0553	18.	.4130	0.0000	0.0000	0.0000	128	1460	3335
2210	2	.0062	-.0068	-.2030	.2923	-.0006	-.0541	17.	.4510	-.1082	.0093	.0240	83	1301	2658
91468															
	1	-.1050	-.0141	.0020	.2536	-.0137	-.0638	17.	.4940	0.0000	0.0000	0.0000	275	1694	4104
	2	-.1215	-.0066	-.2230	.2370	-.0015	-.0551	16.	.4410	-.1788	.0516	.0291	225	1989	4947
30	1	-.0084	-.0054	-.0070	.1833	-.0215	-.0486	16.	.4980	0.0000	0.0000	0.0000	185	1673	5000
30	2	-.0412	.0024	-.1990	.2637	-.0306	-.0475	15.	.5240	-.1850	.0129	.0247	501	2833	6844
110	1	-.0779	-.0164	.0630	.1743	-.0706	-.0361	15.	.6230	0.0000	0.0000	0.0000	138	729	2453
110	2	-.1391	-.0029	-.1630	.1693	-.0439	-.0393	15.	.5910	-.0395	.0303	.0273	111	1436	3326
140	1	.0156	-.0188	0.0000	.0952	-.0082	-.0285	14.	.5580	0.0000	0.0000	0.0000	46	393	1511
140	2	.0012	-.0079	-.1610	.0984	-.0090	-.0263	14.	.5040	.0121	.0093	.0148	35	404	1137
240	1	.1772	-.0131	-.0050	.1419	.0055	-.0205	14.	.4080	0.0000	0.0000	0.0000	6997	11557	16064
240	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
335	1	.3223	-.0166	-.0400	.1545	-.0014	-.0401	14.	.4000	0.0000	0.0000	0.0000	17	552	1820
335	2	-.6386	-.0074	-.2270	.1370	.0020	-.0322	13.	.3480	-.0362	.0152	.0205	63	1078	2201
405	1	-.0023	-.0016	.0070	.1023	-.0148	-.0273	14.	.4240	0.0000	0.0000	0.0000	524	1335	4463
405	2	-.0038	-.0007	-.2310	.1013	-.0074	-.0271	13.	0.0000	-.0081	.0052	.0176	128	1405	4625
530	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
530	2	-.0597	-.0007	.0080	.1680	-.0725	-.0337	13.	0.0000	-.1877	.1051	.0247	838	3514	7957
600	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
600	2	-.0009	-.0008	-.1680	.1771	.0049	-.0513	14.	.3630	-.1129	-.0199	.0395	192	1742	3142
630	1	.0392	-.0015	-.1690	.0054	.0060	-.0017	15.	.2240	0.0000	0.0000	0.0000	167	1553	4373
630	2	.0005	-.0009	-.0520	.0074	-.0022	-.0053	14.	.2030	-.0709	.0108	.0434	58	2140	4135
700	1	.0156	-.0133	.0010	-.0073	.0143	.0250	16.	.3780	0.0000	0.0000	0.0000	75	1251	3409
700	2	.0054	-.0071	-.0370	-.0231	.0130	.0217	16.	.3270	-.3166	-.0222	.0782	203	2388	4294
730	1	-.0227	-.0095	.0110	-.2628	.0136	.0244	17.	1.1260	0.0000	0.0000	0.0000	105	994	2453
730	2	-.0204	-.0040	-.0100	-.2708	.0087	.0304	16.	.9780	-1.1683	.1190	.0931	100	1918	3014
800	1	-.0396	-.0101	-.0030	-.2747	-.0489	.0601	21.	.4340	0.0000	0.0000	0.0000	328	902	2124
800	2	-.0110	-.0042	-.0050	-.2900	-.0272	.0357	20.	.4230	-.4298	.1444	.1703	367	1820	3309
835	1	-.0040	-.0005	.0240	-.2926	.0553	.1101	23.	.4600	0.0000	0.0000	0.0000	229	1188	2620
835	2	-.0015	.0004	-.0330	-.2976	.0668	.1138	24.	.4270	-.8206	.0412	.2055	186	2027	3371
905	1	-.0026	-.0001	.0060	-.4250	.0561	.1209	23.	.5140	0.0000	0.0000	0.0000	335	1491	2773
905	2	-.0043	-.0001	-.0210	-.4414	.0704	.1187	24.	.4890	-.4355	.0852	.1798	167	1531	2880
935	1	-.0089	-.0017	0.0000	-.3802	.0604	.1087	24.	.4570	0.0000	0.0000	0.0000	145	1005	2296
935	2	-.0054	.0049	-.0210	-.4227	.0343	.1185	25.	.4410	-.4996	-.0472	.2177	177	1578	2540

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND	F ELEV	FSD ANGLE	G AZIM	GSD ANGLE	WIND DIR	WIND SHIFT
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC..........				......DYNES/CM2.......			CM/SEC	RAD	RAD	RAD	RAD	RAD	RAD
91468															
1005	1	271.49	105.66	72.38	42.51	-1.525	.163	0.000	281.38	.024	.185	-.054	.289	4.350	.032
1005	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	-.010
1035	1	293.12	118.55	87.57	48.08	-1.883	.174	0.000	305.31	.022	.191	.003	.296	4.396	-.010
1035	2	317.74	160.20	131.10	51.11	.415	8.817	0.000	347.83	.056	.221	.104	.628	4.777	-.148
1105	1	308.12	113.64	85.55	48.91	-1.897	-.017	0.000	319.55	.019	.181	.008	.280	4.413	-.148
1105	2	364.23	124.72	108.75	54.79	-2.853	3.641	0.000	380.60	.028	.168	.053	.312	4.679	.155
1200	1	292.70	119.18	89.76	47.15	-1.807	.521	0.000	305.19	.030	.191	.004	.302	4.324	.155
1200	2	357.41	127.95	104.61	55.16	-2.478	.553	0.000	371.69	.036	.176	.030	.294	4.508	-1.503
1230	1	297.79	117.13	87.13	48.59	-1.932	.442	0.000	309.71	.022	.182	.003	.289	4.354	.031
1230	2	354.89	133.43	104.84	56.46	-3.059	.683	0.000	369.33	.039	.177	.039	.289	4.583	.065
1310	1	272.35	99.09	77.89	44.28	-1.647	.303	0.000	283.11	.025	.184	.005	.290	4.325	-.030
1310	2	333.27	108.72	93.93	52.83	-2.668	.199	0.000	346.11	.030	.161	.047	.281	4.543	-.048
1335	1	250.68	91.77	71.76	41.04	-1.344	-.190	0.000	260.60	.021	.183	.033	.291	4.267	-.057
1335	2	301.56	98.38	93.58	46.38	-1.764	.033	0.000	315.35	.017	.171	.055	.302	4.454	-.096
1400	1	254.98	96.97	76.59	40.63	-1.397	-.049	0.000	265.93	.019	.181	-.010	.302	4.283	.029
1400	2	304.76	110.43	98.95	47.76	-1.931	-2.204	0.000	320.11	.026	.185	.036	.322	4.501	.065
1425	1	290.77	98.71	84.53	46.82	-1.751	-.197	0.000	302.59	.018	.177	.001	.289	4.289	-.005
1425	2	339.39	112.74	100.43	54.90	-2.825	.699	0.000	353.97	.032	.179	.033	.298	4.454	-.043
1450	1	308.05	102.80	87.45	47.82	-1.855	.401	0.000	319.88	.013	.169	.014	.278	4.232	-.069
1450	2	384.41	109.47	102.55	52.54	-2.397	-.013	0.000	397.71	.014	.147	.031	.262	4.363	-.089
1530	1	309.52	101.28	84.22	47.55	-1.689	.582	0.000	320.53	.009	.166	-.005	.270	4.248	.035
1530	2	373.69	116.65	112.17	57.81	-2.508	-.959	0.000	389.35	.006	.169	.050	.291	4.388	.006
1600	1	245.56	94.85	65.66	37.91	-1.270	-.856	0.000	253.75	.018	.171	-.012	.264	4.311	.069
1600	2	304.38	105.86	93.34	49.57	-1.828	-2.617	0.000	316.53	.013	.184	.048	.281	4.439	.053
1630	1	224.96	85.46	63.43	37.23	-1.007	.202	0.000	233.14	.023	.136	-.016	.277	4.309	.303
1630	2	280.28	105.26	82.24	32.25	-1.404	-.329	0.000	290.76	.016	.152	.034	.282	4.395	-.030
1700	1	190.44	70.82	49.74	30.33	-.738	-.216	0.000	196.65	.021	.174	-.039	.264	4.261	-.025
1700	2	241.55	79.74	57.26	22.61	-.955	-1.962	0.000	249.80	.001	.119	.039	.264	4.318	-.082
1735	1	194.54	66.24	46.59	29.30	-.599	.065	0.000	203.82	.006	.160	0.000	.235	4.250	-.052
1735	2	240.31	68.20	55.71	21.00	-.571	-.780	0.000	246.12	-.006	.109	.036	.224	4.240	-.075
1835	1	150.91	52.42	36.39	22.89	-.431	-.181	0.000	155.25	.003	.169	-.009	.251	4.208	-.032
1835	2	181.85	54.85	43.50	16.17	-.414	-.554	0.000	186.53	-.001	.116	.029	.233	4.130	-.103
1835	1	115.15	33.37	28.02	17.64	-.211	-.092	0.000	118.51	.006	.164	-.012	.247	4.171	-.034
1835	2	152.29	40.04	31.77	12.43	-.254	-.393	0.000	155.32	-.010	.100	.022	.204	4.049	-.075
1905	1	123.07	39.69	30.23	19.07	-.280	-.232	0.000	126.83	.005	.172	0.000	.257	4.178	-.005
1905	2	152.94	43.01	35.04	13.07	-.253	-.332	0.000	155.44	-.009	.106	.024	.216	4.038	-.013

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSQ PARTS PER 100,000	F	G
91463															
1005	1	-.0340	0.0000	-.0390	-.3425	.0701	.1119	24.	.4680	0.0000	0.0000	0.0000	373	1482	4386
1005	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1035	1	.0068	-.0026	-.0180	-.6326	.0355	.1810	26.	.6250	0.0000	0.0000	0.0000	692	1625	3518
1035	2	-.6785	.0129	-.1260	-.8107	-.1837	.1636	26.	.5660	.2865	-.0394	.1365	3019	4999	8697
1105	1	-.0160	-.0018	-.0210	-.5956	.0506	.1502	26.	.5990	0.0000	0.0000	0.0000	319	1054	2101
1105	2	.1771	.0089	.0500	-.5806	-.0733	.1668	26.	.5140	.0913	-.1254	.1428	69	665	2005
1200	1	.0842	.0033	-.0360	-.5774	.0454	.1587	26.	.5860	0.0000	0.0000	0.0000	827	1971	3200
1200	2	1.5003	.0154	-.0090	-.6182	.0905	.1787	27.	.5300	.0073	-.2465	.1254	161	962	2118
1230	2	-.0286	.0009	-.0160	-.2735	.1585	.1302	25.	.6590	0.0000	0.0000	0.0000	248	1073	2222
1230	2	-.0643	.0154	.0100	-.2750	.1625	.1344	26.	.4970	-.8037	-.3186	.1713	169	1134	2392
1310	1	.0297	.0025	-.0150	-.4016	.0529	.1226	25.	.5480	0.0000	0.0000	0.0000	169	1123	2168
1310	2	.0484	.0038	.0730	-.3619	.0521	.1153	27.	.4540	.2122	.1944	.0772	339	1171	3032
1335	1	.0484	-.0003	-.0140	-.4385	.0684	.1207	26.	.5160	0.0000	0.0000	0.0000	212	1108	2465
1335	2	.0949	.0014	.0740	-.3402	.0489	.1011	27.	.3940	-.0270	.1117	.1314	116	802	2197
1400	1	-.0342	-.0034	-.0430	-.3605	-.0671	.1395	26.	.5430	0.0000	0.0000	0.0000	466	1269	2937
1400	2	-.0870	-.0001	.0700	-.3910	-.0477	.1640	27.	.5090	-.3058	.2612	.1032	626	1451	3367
1425	1	.0040	-.0017	-.0310	-.3546	.0239	.1287	27.	.4290	0.0000	0.0000	0.0000	131	674	1686
1425	2	.0461	.0098	.0130	-.4134	-.0177	.1553	28.	.4050	.1233	.1112	-.0027	65	1014	2226
1450	1	.0718	-.0049	-.0190	-.2858	.0194	.0900	27.	.3080	0.0000	0.0000	0.0000	136	518	943
1450	2	.0898	-.0009	-.0160	-.2470	-.0064	.0920	28.	.2650	.2448	-.1855	-.0059	24	233	443
1530	1	-.0304	-.0072	-.0290	-.1624	.0320	.0532	26.	.2100	0.0000	0.0000	0.0000	11	406	939
1530	2	-.0096	-.0103	.1560	-.2114	.0326	.0494	28.	.1960	.5840	.4584	.0294	100	603	1817
1600	1	-.0813	-.0015	.0040	-.1116	.2153	.0140	28.	1.3000	0.0000	0.0000	0.0000	76	754	1621
1600	2	-.0710	-.0098	.2250	-.1080	.2915	-.0475	29.	.9290	.1061	.0153	.0817	192	1285	2384
1630	1	-.0053	.0031	-.0350	-.0460	.0043	-.0085	28.	.2830	0.0000	0.0000	0.0000	321	1342	2765
1630	2	.0215	-.0013	-.1950	-.0347	.0049	-.0047	29.	.2090	.5081	.1991	.0013	348	1047	2668
1700	1	.0208	.0032	-.0320	.2044	-.0564	-.0367	27.	.4120	0.0000	0.0000	0.0000	185	1001	2742
1700	2	.0584	-.0079	-.1890	.2083	-.1365	-.0449	28.	.3450	-.3327	.5536	.1241	21	253	1766
1735	1	.0543	-.0097	-.0210	.2905	.0092	-.0617	24.	.4860	0.0000	0.0000	0.0000	40	526	1168
1735	2	.0604	-.0131	-.2250	.2267	-.0473	-.0377	25.	.4070	-.4064	.1799	.0213	3	115	1338
1835	1	.0248	-.0145	-.0060	.3364	-.0369	-.0544	23.	.6270	0.0000	0.0000	0.0000	107	689	2339
1835	2	.0866	-.0094	-.2160	.3101	-.0753	-.0459	24.	.5590	-.6703	.3265	.0844	82	368	1454
1835	1	.0306	-.0076	.0460	.0746	-.0136	-.0317	24.	.9200	0.0000	0.0000	0.0000	13	669	2657
1835	2	.0604	-.0157	-.2080	.1307	-.0237	-.0272	24.	.6940	-.1133	.0378	.0301	15	155	961
1905	1	-.0076	-.0126	.0460	.1984	-.0364	-.0515	24.	.4880	0.0000	0.0000	0.0000	102	1135	3382
1905	2	.0006	-.0156	-.2120	.1644	-.0359	-.0296	24.	.4100	-.0471	.0453	.0242	89	180	700

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	RWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
		....	WIND ST DEV	....CM/SEC....	....	REYNOLDS STRESSES	......DYNES/CM2......	......							
91468															
1930	1	122.57	37.29	28.87	17.54	-.244	-.065	0.000	125.96	.003	.158	-.004	.244	4.172	-.003
1930	2	163.65	43.64	35.88	13.10	-.243	-.440	0.000	167.34	-.013	.098	.022	.209	4.017	-.018
2000	1	142.78	47.43	35.32	22.37	-.385	-.100	0.000	147.15	.009	.174	.009	.258	4.193	.009
2000	2	181.00	47.58	45.04	15.76	-.339	-.683	0.000	185.88	-.010	.110	.038	.234	4.078	.044
2030	1	115.66	31.85	25.01	15.87	-.188	-.026	0.000	118.41	-.003	.148	-.005	.225	4.140	-.039
2030	2	151.84	35.29	30.88	11.51	-.188	-.377	0.000	154.65	-.016	.090	.028	.195	3.955	-.112
2230	1	143.57	46.96	36.09	21.38	-.381	.051	0.000	148.09	.004	.165	.007	.262	3.864	-.288
2230	2	173.40	47.50	40.60	15.83	-.380	-.259	0.000	177.48	-.001	.112	.023	.217	4.000	.049
2300	1	136.87	40.33	34.59	20.73	-.315	.048	0.000	141.18	-.007	.161	-.002	.257	3.864	.008
2300	2	162.63	40.45	38.93	13.53	-.266	-.371	0.000	166.66	-.012	.102	.027	.223	3.963	-.041
2330	1	126.49	43.37	31.78	19.70	-.322	-.040	0.000	130.57	.011	.178	-.005	.268	3.867	.006
2330	2	160.99	45.56	36.61	13.11	-.237	-.506	0.000	164.65	-.014	.101	.026	.217	3.958	-.004
91568															
	1	144.48	46.42	36.07	22.08	-.360	-.016	0.000	148.97	-.002	.169	-.007	.258	3.868	.004
	2	179.14	52.15	44.85	16.29	-.334	-.607	0.000	184.07	-.007	.116	.021	.237	3.946	-.008
30	1	146.47	46.30	36.33	21.17	-.364	.039	0.000	150.92	-.001	.159	-.004	.254	3.869	-.003
30	2	177.68	48.09	40.61	14.82	-.336	-.372	0.000	181.67	-.010	.101	.021	.213	3.931	-.014
100	1	118.65	37.41	29.95	17.87	-.257	.025	0.000	122.52	.005	.168	-.017	.266	3.869	.014
100	2	150.66	44.31	33.99	12.42	-.249	-.244	0.000	153.89	-.010	.105	.011	.209	3.856	-.065
130	1	122.30	41.99	31.08	18.66	-.308	.007	0.000	126.26	.003	.169	-.015	.266	3.873	.001
130	2	149.54	39.97	36.00	12.77	-.236	-.260	0.000	153.35	-.009	.111	.023	.228	3.915	.047
200	1	136.51	42.65	34.22	20.90	-.344	.063	0.000	140.84	.002	.170	-.008	.261	3.875	-.004
200	2	165.86	45.56	36.36	13.57	-.257	-.279	0.000	169.44	-.005	.104	.016	.210	3.788	-.120
230	1	109.43	37.27	28.56	17.11	-.229	-.032	0.000	113.20	.003	.179	-.014	.276	3.878	.009
230	2	144.16	39.43	31.21	11.60	-.167	-.137	0.000	147.18	-.012	.099	.019	.209	3.823	.032
300	1	98.15	31.30	25.63	14.52	-.143	-.024	0.000	101.48	-.003	.161	-.027	.270	3.883	.017
300	2	123.64	33.86	26.00	9.69	-.110	-.118	0.000	126.08	-.013	.101	.021	.204	3.891	.066
330	1	139.62	47.62	34.16	20.53	-.361	.086	0.000	143.75	-.001	.163	-.020	.253	3.886	-.003
330	2	178.59	50.66	39.27	14.39	-.361	-.601	0.000	182.47	-.013	.0[illegible]	.022	.211	3.656	-.236
400	1	147.52	46.87	34.57	21.80	-.330	.028	0.000	151.60	-.004	.167	-.012	.245	3.889	-.006
400	2	181.04	50.25	38.00	14.99	-.383	-.329	0.000	184.59	-.008	.104	.026	.233	3.630	-.031
430	1	156.93	48.17	38.22	23.58	-.451	.047	0.000	161.70	.003	.173	-.014	.259	3.893	.006
430	2	192.03	49.59	43.50	16.23	-.423	-.347	0.000	196.43	-.006	.108	.073	.218	3.664	.037
500	1	162.55	54.63	39.66	24.36	-.449	.166	0.000	167.36	.005	.167	-.004	.253	3.895	-.009
500	2	200.20	55.45	48.50	16.96	-.292	-.010	0.000	205.54	-.012	.106	.025	.236	3.833	.167
530	1	174.40	59.44	45.53	27.33	-.597	.105	0.000	180.22	.008	.176	-.001	.267	3.895	-.003
530	2	213.25	65.07	58.85	19.31	-.575	-.397	0.000	220.19	-.009	.121	.038	.238	3.874	.028

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....	HV	HW	AIR TEMP MEAN CENTIGRADE	ST DEV	EU LATENT HEAT TRANS ....CAL/(CM2-MIN).....	EV	EW	LIMITS EXCEEDED VSO PARTS PER 100,000	F	G
91468															
1930	1	-.0010	-.0111	-.0380	.1704	-.0020	-.0387	24.	.4400	0.0000	0.0000	0.0000	25	707	2355
1930	2	.0047	-.0180	-.2130	.1681	-.0229	-.0256	24.	.3840	-.1261	.0159	.0203	0	111	882
2000	1	-.0139	-.0091	.0260	.2161	-.0122	-.0585	24.	.5610	0.0000	0.0000	0.0000	65	1186	2850
2000	2	-.0625	-.0152	-.2350	.1738	-.0442	-.0355	24.	.3920	-.0244	.0164	.0244	3	113	1286
2030	1	.0387	-.0139	-.0100	.1432	-.0140	-.0321	23.	.5210	0.0000	0.0000	0.0000	5	600	1760
2030	2	.0984	-.0203	-.2080	.1435	-.0518	-.0308	24.	.4570	-.0194	.1063	.0476	21	66	763
2230	1	.2918	-.0137	-.0290	.1970	.0007	-.0499	23.	.4000	0.0000	0.0000	0.0000	140	968	2454
2230	2	-.0584	-.0092	-.2530	.1550	-.0106	-.0292	23.	.3550	-.0328	.0148	.0187	23	207	1001
2300	1	-.0063	-.0218	-.0510	.1547	.0065	-.0427	22.	.4000	0.0000	0.0000	0.0000	50	609	1845
2300	2	.0281	-.0174	-.2380	.1257	-.0213	-.0263	22.	.3350	-.0227	.0112	.0192	0	41	1167
2330	1	-.0094	-.0092	-.0080	.2717	.0034	-.0491	22.	.9220	0.0000	0.0000	0.0000	159	1584	3260
2330	2	-.0130	-.0173	-.2260	.2049	-.0651	-.0206	23.	.6840	-.0332	.0267	.0169	4	74	1345
91568															
	1	-.0058	-.0184	-.0360	.1669	-.0060	-.0416	24.	.3640	0.0000	0.0000	0.0000	90	957	2260
	2	-.0080	-.0132	-.2100	.1636	-.0001	-.0242	23.	.3210	-.0240	.0104	.0172	2	281	1389
30	1	.0030	-.0167	-.0420	.1801	.0045	-.0434	24.	.3670	0.0000	0.0000	0.0000	45	660	1782
30	2	.0030	-.0163	-.2450	.1539	-.0189	-.0278	23.	.3170	-.0205	.0073	.0167	0	34	861
100	1	-.0131	-.0115	-.0430	.1445	.0078	-.0372	23.	.3980	0.0000	0.0000	0.0000	78	925	2996
100	2	.0547	-.0167	-.2430	.1671	-.0073	-.0198	23.	.3690	-.0731	-.0111	.0119	24	169	872
130	1	-.0021	-.0146	-.0180	.1781	.0033	-.0404	23.	.3940	0.0000	0.0000	0.0000	59	1099	2555
130	2	-.0576	-.0167	-.2330	.1340	-.0037	-.0203	23.	.3340	-.0178	.0118	.0138	38	308	1273
200	1	.0052	-.0152	-.0270	.1417	.0060	-.0396	23.	.3570	0.0000	0.0000	0.0000	47	990	2523
200	2	.1095	-.0107	-.2300	.1152	.0022	-.0208	22.	.3140	.0193	.0080	.0137	4	137	1112
230	1	-.0149	-.0157	-.0530	.1673	-.0021	-.0316	22.	.4050	0.0000	0.0000	0.0000	205	1538	3990
230	2	-.0390	-.0167	-.2310	.1555	.0083	-.0132	22.	.3450	-.0890	-.0627	.0041	0	109	976
300	1	-.0182	-.0161	-.0260	.1186	-.0019	-.0241	22.	.3960	0.0000	0.0000	0.0000	13	862	3563
300	2	-.0728	-.0176	-.2300	.1169	-.0031	-.0135	22.	.3550	.0001	.0035	.0115	13	190	1111
330	1	.0056	-.0175	-.0490	.1826	.0109	-.0330	22.	.3950	0.0000	0.0000	0.0000	12	769	2116
330	2	.2217	-.0194	-.1890	.1927	-.0650	-.0361	22.	.4180	-.0551	.0792	.0342	0	92	489
400	1	.0067	-.0194	-.0030	.1180	-.0028	-.0237	21.	.2440	0.0000	0.0000	0.0000	26	876	1791
400	2	.0209	-.0163	-.2260	.1186	-.0063	-.0190	21.	.1860	.0875	-.0145	.0064	7[illegible]	209	771
430	1	-.0072	-.0171	-.0060	.1240	.0011	-.0282	21.	.2380	0.0000	0.0000	0.0000	136	1131	2350
430	2	-.0475	-.0144	-.2300	.1090	-.0062	-.0209	21.	-.0753	.0108	.0031	.0122	40	165	984
500	1	.0140	-.0119	-.0530	.1467	.0177	-.0273	22.	.2670	0.0000	0.0000	0.0000	40	832	2002
500	2	-.1700	-.0186	-.2180	.1193	.0126	-.0174	21.	.2260	.0169	.0108	.01[illegible]	39	111	887
530	1	.0030	-.0108	-.0270	.1251	.0054	-.0306	22.	.2220	0.0000	0.0000	0.0000	124	1053	2184
530	2	-.0360	-.0196	-.2430	.1278	.0130	-.0235	21.	.2050	.0482	.0250	.0201	72	278	1542

TIME START	SITE	MEAN WIND	USD	VSD	WSD	RUW	RUV	PWV	HORIZ WIND CM/SEC	F ELEV RAD	FSD ANGLE RAD	G AZIM RAD	GSD ANGLE RAD	WIND DIR RAD	WIND SHIFT RAD
			WIND ST DEV			REYNOLDS STRESSES									
		........CM/SEC..........				......DYNES/CM2.......									
91568															
600	1	182.91	60.57	46.43	27.67	-.579	.027	0.000	188.82	-.002	.172	.004	.265	3.889	-.010
600	2	212.44	65.72	51.15	25.08	-.837	-.418	0.000	218.04	.014	.141	.020	.234	3.851	-.006
630	1	190.35	67.69	48.89	29.45	-.789	.180	0.000	196.82	.008	.181	.010	.269	3.873	-.023
630	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	-.030
700	1	182.09	69.88	51.94	29.78	-.794	.124	0.000	189.63	.018	.196	.005	.307	3.838	-.030
700	2	146.61	66.89	49.33	28.74	-.868	-.146	0.000	154.35	.020	.255	.041	.350	3.785	-.524
730	1	194.82	71.26	51.80	31.33	-.716	.136	0.000	201.76	.004	.190	.010	.294	3.794	-.048
730	2	150.99	66.69	49.17	29.56	-.883	-.275	0.000	158.70	.019	.246	.034	.342	3.911	.132
800	1	187.12	82.68	53.72	32.37	-.801	.085	0.000	194.65	.019	.214	.019	.309	3.760	-.044
800	2	147.70	72.72	56.66	30.66	-.997	-.494	0.000	157.31	.029	.256	.062	.276	3.921	-.018
830	1	228.11	85.23	63.85	37.02	-1.031	.102	0.000	236.91	.010	.187	.010	.289	3.748	-.003
830	2	180.81	79.55	63.40	35.08	-1.136	-.039	0.000	191.07	.014	.244	.057	.352	4.046	.120
1200	1	213.52	196.63	164.72	69.38	-2.120	15.460	0.000	262.02	.220	.399	.131	.579	4.409	0.000
1200	2	189.06	161.77	109.72	57.64	-2.459	1.776	0.000	208.40	.242	.392	.349	.396	4.762	0.000
1300	1	322.32	135.86	99.07	50.96	-2.402	-.506	0.000	336.88	.019	.194	-.209	.326	3.795	-.275
1300	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1330	1	315.62	146.85	101.37	48.78	-1.934	.304	0.000	330.31	.051	.230	-.249	.386	3.806	.052
1330	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1400	1	318.63	150.78	97.96	49.98	-1.979	.719	0.000	330.56	.038	.227	-.177	.364	3.812	-.066
1400	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000
1430	1	307.63	136.75	97.46	48.63	-1.941	.264	0.000	321.93	.030	.227	-.223	.356	3.824	.058
1430	2	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000

TIME START	SITE	ETA RAD	THETA RAD	BETA RAD	HU	HV	HW	AIR TEMP MEAN	AIR TEMP ST DEV	EU	EV	EW	LIMITS EXCEEDED VSQ	F	G
					SENSIBLE HEAT TRANS ....CAL/(CM2-MIN)....			CENTIGRADE		LATENT HEAT TRANS ....CAL/(CM2-MIN).....			PARTS PER 100.000		
91568															
600	1	.0086	-.0194	-.0040	.0886	-.0015	-.0207	22.	.1970	0.0000	0.0000	0.0000	171	938	2093
600	2	-.0057	-.0002	-.2040	.0869	.0007	-.0202	21.	.1560	.1047	-.0970	-.0838	27	519	1547
530	1	.0242	-.0147	.0010	-.0178	.0024	-.0007	23.	.2400	0.0000	0.0000	0.0000	137	1288	2286
530	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
700	1	.0251	-.0095	-.0320	-.1378	.0029	.0314	23.	.2900	0.0000	0.0000	0.0000	366	1907	4391
700	2	.5106	-.0309	-.0510	-.1288	.0201	.0257	23.	.3250	-.0853	-.0766	.0456	1446	5842	10267
730	1	.0466	-.0185	-.0270	-.1409	-.0061	.0619	24.	.4430	0.0000	0.0000	0.0000	299	1691	3119
730	2	-.1621	-.0256	-.0680	-.1762	-.0534	.0523	24.	.4480	-.2239	.1358	.0539	1001	5001	8815
800	1	.0345	-.0117	-.0400	-.4441	-.0383	.0876	26.	.7430	0.0000	0.0000	0.0000	814	2897	5179
800	2	-.0227	-.0250	-.0870	-.3862	.0857	.0937	25.	.6870	-.3928	-.0753	.1201	1493	6644	12454
830	1	.0007	-.0129	-.0170	-.3712	.0163	.1245	24.	.5850	0.0000	0.0000	0.0000	232	1273	2432
830	2	-.1399	-.0292	-.0850	-.3115	-.0403	.1029	24.	.5520	-.5270	.1044	.1507	1054	4669	9421
1200	1	-.4450	-.0074	.0340	-2.2449	-1.2484	.1708	25.	.8080	0.0000	0.0000	0.0000	27165	37812	43367
1200	2	-.3379	.0025	-.1060	-1.9726	-.8800	.1487	27.	.9590	-18.6285	-9.2447	.6094	28796	37799	45940
1300	1	.2668	-.0118	-.0020	-.7896	.0033	.2072	25.	.6160	0.0000	0.0000	0.0000	1040	2128	6626
1300	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1330	1	-.1052	-.0049	-.0180	-.4554	-.0041	.1460	24.	.4820	0.0000	0.0000	0.0000	5252	6488	15324
1330	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1400	1	.0261	-.0141	-.0180	-.6311	-.0537	.1600	25.	.5250	0.0000	0.0000	0.0000	4819	5718	11133
1400	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0
1430	1	-.0905	-.0141	-.0250	-.4801	-.0040	.1334	24.	.4300	0.0000	0.0000	0.0000	3216	4409	11116
1430	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.	0.0000	0.0000	0.0000	0.0000	0	0	0

IDENTIFICATION OF HEADINGS ON DATA LISTING

TIME: Starting time. Pacific Standard time in 1967 and Central Standard in 1968. During 1967, the runs ended at 1 minute and 20 seconds before the hour or half-hour. During 1968, runs were for 30 minutes.

SITE (1967): The site description is given in Chapter 1, as are the instrument locations for April 26-27, and May 2-5. On April 22-25, all anemoclinometers were at 1 meter at the north end of the field.

SITE (1968): Site 1 was located 60 meters south of the instrument trailer in a field of snapbeans. A 3-cm anemoclinometer was mounted at a height of 117 cm. The beans were 25 to 30 cm high.

Site 2 was 10 meters east of site 1. A 3-cm anemoclinometer was mounted at a height of 117 cm except following 1030 on September 14, when the anemoclinometer was moved to 210 cm until 0630 on September 15. It was at 75 cm after 0700 on September 15 for the remainder of the day.

The bean fetch was 60 meters to the north, 50 meters to the east and west, and 100 meters to the south. Beyond the beans to the south was alfalfa extending for 150 meters to a 15-meter high woods. To the west was a 100-meter alfalfa field extending to a 10-meter high shelter belt. Fetch to the northwest beyond the beans was 200 meters of low crops to a shelter belt. To the east was 300 meters of alfalfa extending to a woods.

Mean wind: $\bar{U}$.

USD: Standard deviation, $(\overline{u'^2})^{1/2}$, cm/sec.

VSD: " " , $(\overline{v'^2})^{1/2}$, cm/sec.

WSD: " " , $(\overline{w'^2})^{1/2}$, cm/sec.

RUW: Reynold's stress, $\overline{\rho u'w'}$, dynes/cm^2.

RUV: " " $\overline{\rho u'v'}$, dynes/cm^2.

RWV: " " , $\overline{\rho w'v'}$, dynes/cm^2.

HORIZ. WIND: Equivalent to anemometer wind, $(\overline{u_1^2 + v_1^2})^{1/2}$, cm/sec.

F, ELEV. ANGLE: Mean angle of wind with x_1, y_1 plane of anemoclinometer, $\bar{F}_4$ in program, radians.

FSD, ELEV. ANGLE: Standard deviation of F, $(\overline{(F')^2})^{1/2}$.

G, AZIM. ANGLE: Mean angle of wind with the x_1, z_1 plane of the anemoclinometer, ($\bar{G}_2$ in program), radians.

GSD, AZIM. ANGLE: Standard deviation of azimuth angle, $(\overline{(G_4')^2})^{1/2}$ in program.

WIND DIR: Mean wind azimuth direction, $\bar{G}_2 + \bar{G}_3$ in program, measured clockwise from North, radians. (The listing is incorrect and gives mean G_3; the G AZIM. ANGLE, $\bar{G}_2$, should be added to give the wind direction).

WIND SHIFT: Change in azimuth of mean direction for one half-hour period from the previous half-hour, $\bar{G}_4$ in program.

ETA: Azimuth angle used in coordinate transform, arctan $(\bar{v}_1/ \bar{u}_1)$, radians.

THETA: Elevation angle used in coordinate transform, arctan $[\bar{w}_1/(\bar{u}_1^2 + \bar{v}_1^2)^{1/2}]$, radians.

BETA: Rotation angle about x-axis (anemoclinometer axis), to force $\overline{w'v'} = 0$, see transform program.

HU: $\rho c_p \overline{u'T'}$, cal $cm^{-2} min^{-1}$.

HV: $\rho c_p \overline{v'T'}$, cal $cm^{-2} min^{-1}$.

HW: $\rho c_p \overline{w'T'}$ vertical heat flux, cal $cm^{-2} min^{-1}$.

AIR TEMP. MEAN: Mean air temperature, Celsius.

AIR TEMP. ST. DEV: $(\overline{T'^2})^{1/2}$.

EU: $\lambda \overline{u'q'}$, cal $cm^{-2} min^{-1}$.

EV: $\lambda \overline{v'q'}$, cal $cm^{-2} min^{-1}$.

EW: $\lambda \overline{w'q'}$ (latent heat of evaporation), cal $cm^{-2} min^{-1}$.

LIMITS EXCEEDED (times per 100,000 scans):

VSQ: Times V^2 voltages were negative and set equal to zero (Program equation [1A]).

F : Times elevation angle, F, exceeded 40° (0.698 rad) and was set equal to 40° (program equation [7]).

G : Times azimuth angle, G2, exceeded 40° and was set equal to 40° (Program equation [5]).

In 1967, the position of the anemoclinometer was fixed and the azimuth angle G often was very large. When G was greater than 25°, the data were discarded. When correlation coefficients between u', v', and w' exceeded unity, the run was discarded.

The data listing obviously includes more digits than are experimentally significant.

Notes on 1968 Data

No effort has been made to check the data gathered at Hancock, Wisconsin during 1968. The only data excluded were those where notes indicated obvious instrument failure or when winds were less than 50cm/sec.

There were times when the azimuth servo-drive failed and had to be replaced. The accuracy of the azimuth angle may be in doubt during preceeding periods. Some notes regarding questionable periods are given below.

Site 1: The azimuth potentiometer was not referenced during September 11-12

Site 2: The servo system definitely malfunctioned from 2000h September 11 through 0550h September 12. The motor required replacement at 1200h on September 12. From 1035h September 14 onward, the anemoclinometer was on a mast driven at 1/3 the earlier speed. We believe performance was satisfactory; however, the slow response may have created larger error than would be observed with a faster motor.

General: At night when winds were intermittent and low, the uv signal to the servo system occasionally was too low to actuate the motor. If wind direction had shifted appreciably following a calm period, at times the servo system turned the

wrong direction until it struck a limit stop.

<u>Data differences between site 1 and site 2</u>:

Lower horizontal wind, higher $|\overline{\rho u'w'}|$ and more negative $\overline{\rho u'v'}$ generally are observed at Site 2. This possibly may be due to spatial heterogeneity of the row crop; however, a more likely possibility is that the differences are due to the location of the humidity sensor (see Chapter 5), which may have changed the wind flow around the sphere. There may be other reasons, not yet considered.

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13. ABSTRACT

A small, three-dimensional pressure-probe anemometer (IMFL anemoclinometer) was used to measure the three components of the wind vector, shear stress, and the ratio of the standard deviation of the vertical wind to the friction velocity as influenced by atmospheric stability. Horizontal wind and shear stress have been compared with independent wind profile and shear stress meter measurements. The anemometer was coupled with a fast thermometer for eddy correlation measurements of sensible heat flux and with a fast hygrometer for measurements of latent heat flux. The eddy correlation measurements of sensible and latent heat fluxes were compared with independent energy balance, wind profile, and sonic anemometer-thermometr measurements.

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KEY WORDS	LINK A ROLE	LINK A WT	LINK B ROLE	LINK B WT	LINK C ROLE	LINK C WT
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Energy balance						

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